A

BOTANICAL DICTIONARY:

OR,

ELEMENTS

OF

SYSTEMATIC AND PHILOSOPHICAL

BOTANY.

BY COLIN MILNE, LL.D.

AUTHOR OF INSTITUTES OF BOTANY, AND HABITATIONS OF ENGLISH PLANTS.

THE THIRD EDITION,

REVISED, CORRECTED, AND VERY CONSIDERABLY ENLARGED.

Illustrated by Twenty-five New Plates.

——————————Πλεῖστα φέρει ζείδωρος ἄρουρα
Φάρμακα, πολλὰ μὲν ἐσθλὰ μεμιγμένα, πολλὰ δὲ λυγρά.

HOM. ODYSS. Δ'.

Quid majora ſequar? Salices, humileſque geniſtæ,
Et tiliæ, pecori frondem, aut paſtoribus umbras
Sufficiunt, ſepemque ſatis, et pabula melli.
——————————Juvat arva videre
Non raſtris, hominum non ulli obnoxia curæ.
Ipſæ Caucaſio steriles in vertice ſilvæ
Dant alios aliæ foetus: dant utile lignum
Navigiis pinos, domibus cedrumque cupreſſos.
Hinc radios trivere rotis, hinc tympana plauſtris
Agricolæ, et pandas ratibus poſuere carinas.

VIRG. GEORG. Lib. II.

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TO HIS GRACE

HUGH PERCY,

DUKE AND EARL OF NORTHUMBERLAND,

EARL PERCY, AND BARON WARKWORTH,

LORD LIEUTENANT AND VICE-ADMIRAL OF NORTHUMBERLAND AND NEWCASTLE-UPON-TYNE, HIGH STEWARD OF LAUNCESTON, AND CONSTABLE OF LAUNCESTON-CASTLE, ONE OF THE COUNCIL OF STATE OF THE PRINCE OF WALES IN CORNWALL, AND KNIGHT OF THE MOST NOBLE ORDER OF THE GARTER;

THE FOLLOWING IMPROVED EDITION OF A WORK,

WHICH ORIGINALLY APPEARED UNDER THE DISTINGUISHED AUSPICES OF

HIS ILLUSTRIOUS FATHER, THE MÆCENAS OF HIS AGE,

ON WHOSE APPROBATION OF THIS HIS FIRST ATTEMPT TO ILLUSTRATE AND PROMOTE A SCIENCE, WHICH HIMSELF NOT ONLY PATRONIZED, BUT EMINENTLY ADORNED, THE AUTHOR WILL EVER REFLECT WITH PECULIAR SATISFACTION,

IS INSCRIBED,

WITH THAT PROFOUND RESPECT AND VENERATION, WHICH THE TRULY

DIGNIFIED CONDUCT

HIS GRACE HAS UNIFORMLY MAINTAINED,

BOTH IN PUBLIC AND DOMESTIC LIFE, MORE EVEN THAN

HIS ELEVATED RANK,

OR

THE SPLENDOR OF HIS ANCESTRY,

IS SO JUSTLY ENTITLED TO COMMAND,

BY HIS GRACE'S VERY FAITHFUL,

AND MOST DEVOTED

HUMBLE SERVANT,

COLIN MILNE.

PREFACE.

THIS corrected and greatly enlarged edition of his Botanical Dictionary, the Author cannot ſubmit to the public without previouſly embracing an opportunity which ſo naturally preſents itſelf, of expreſſing, in the ſtrongeſt terms, his ſincere acknowledgements for the very favourable reception which the work has obtained ſince its firſt publication; and in particular, for the mention ſo honourably made of it in the periodical, and various other writings of the Learned, both in this country and on the Continent.

Had circumſtances permitted, it was fully the Author's intention, among other prefatory matter, to have offered ſome remarks on his Deſcriptions of the Natural Orders of Linnæus—a part of his ſubject, on which he has beſtowed a more than ordinary ſhare of attention, as the Deſcriptions alluded to, he muſt conſider as peculiarly and excluſively his own *. But this he muſt at preſent decline;

* See the article FRAGMENTA METHODI NATURALIS.

partly

partly in conſideration of the ſize which the volume has already attained, but chiefly in juſtice to the Publiſher, who, having incurred a conſiderable expence in adorning it, has a right to expect that he may not be expoſed to ſuffer by any unneceſſary delay in the publication.

To his ingenious and excellent friend, Dr. THORNTON, at whoſe earneſt and repeated requeſt this edition was undertaken, the Author ſtands indebted for many uſeful ſuggeſtions towards the improvement of the preſent work, and for ſeveral valuable communications during the progreſs of it. With the literary character of this gentleman the world is ſo well acquainted, that any endeavour of the Author to add to his well-earned fame, would be ſuperfluous. But though it be generally known that his eminence in his favourite ſcience can only be equalled by the generous ardour he manifeſts in its purſuit, and the diſintereſted public-ſpirited ſacrifices which for years he has been making for the advancement of its objects, it belongs to thoſe alone who enjoy the happineſs of his friendſhip, to remark the ſuperior qualities of his mind and heart—that noble independence which, in matters of ſcience, diſdains the fetters of authority, and dares to think for itſelf—that candour, ſo eſtimable, becauſe ſo rare, which, on even the ſhadow of merit,

is eager to beſtow its due portion of applauſe—that mild forbearance, which he never fails to exerciſe towards thoſe who, envious of abilities which they deſpair to reach, have not the magnanimity to emulate his candour;—above all, that love of virtue (not the inſeparable concomitant of learning) which pervades every page of his writings, prompting him to render every talent and purſuit ſubſervient to the advancement of the eſſential intereſts of morality and religion. In praiſe of ſuch a man, (and the portrait is neither ideal, nor drawn by the flattering hand of partial friendſhip) it were ſcarce poſſible to exceed; nor of his fate with the moſt diſtant poſterity, requires it much prophetical ſagacity to pronounce,

"SEMPER HONOS, NOMENQUE TUUM, LAUDESQUE MANEBUNT."

ERRATA.

ERRATA.

The reader is requested to correct the following inaccuracies. In the article ACINI, for "*fructifying*," read "*raspberry*;"—At the end of the article BRACTEATA, for "*and* is exemplified, &c." read "*which* is exemplified;"—In the article CAPITATUS *flos*, at the beginning, for "*a fructification*, generally consisting of *many flowers*," read, "*a flower* generally consisting of *many fructifications*;"—In the article CORCULUM, line 5, for "*the former*," read, "*the latter*;"—and in STRUCTURA VEGETABILIS, page 3, line 23, after *liber*, for, "*from its fine and thin plates*, &c." read, "*the bones of birds*, (*which*) *being originally formed from its fine, thin plates*."

*** The Binder is desired to place, immediately after the Preface, Ray's Method—Tournefort's ditto, and Linnæus's Analysis.—The Plates, Index, and Alphabetical List, conclude the work.

RAY'S METHOD.

This complex but beautiful Mode of Arrangement is founded chiefly on the Fruit, combined with the Habit or Port of Plants, and a Variety of other Circumſtances. Plants, according to this Method, are primarily divided into

Division	No.	CLASSES.	EXAMPLES.
Such as bear no Buds, termed Herbs; Imperfect plants,	[illegible]	*Submarinae*,	Corallines, ſpunge, fuci.
	[illegible]	*Fungi*,	Muſhrooms.
	[illegible]	*Muſci*,	Moſſes.
	[illegible]	*Capillares*,	All the fern tribe.
Perfect plants, riſing with two ſeed-leaves, without petals,	5	*Apetalae*,	Hop, hemp, nettle, dock, orach, amaranthus, alchemilla, plantain, knawel, mercury
with petals, with a compound flower,	6	*Planipetalae*,	Lettuce, dandelion, hawk-weed, goat's-beard, nipple-wort, ſuccory.
	7	*Diſcoideae*,	Aſter, golden-rod, groundſel, colt's-foot, cudweed, leopard's-bane.
	8	*Corymbiferae*,	Sun-flower, marigold, fever-few, daiſy, wormwood, tanſy, milfoil.
	9	*Capitatae*,	Thiſtle, artichoke, blue-bottle, burdock, ſaw-wort, ſcabious, teazel.
with a ſimple flower, having naked ſeeds, in number one,	10	*Monoſpermae*,	Valerian, thrift, agrimony, marvel of peru, fumatory.
in number two, — the flowers growing in umbels,	1[illegible]	*Umbelliferae*,	Laſer-wort, ſhepherd's-needle, hemlock, ſanicle, angelica, maſter-wort.
in number two, — the leaves ſurrounding the ſtem in rays,	1[illegible]	*Stellatae*,	Madder, gooſe-graſs, wood-roof.
in number four, — the leaves rough and hairy,	1[illegible]	*Aſperifoliae*,	Comfrey, borage, lung-wort, bugloſs, hound's-tongue, mouſe-ear.
in number four, — the flowers growing in whirls round the ſtem,	14	*Verticillatae*,	Roſemary, mint, marjoram, ſage, betony, germander.
in number many.	15	*Polyſpermae*,	Water-plantain, ranunculus, herb-bennet, adonis, anemone.
having the ſeeds covered, with a pulpy ſubſtance, of the apple kind,	16	*Pomiferae*,	Cucumber, melon, pumpkin, gourd, paſſion-flower.
with a pulpy ſubſtance, of the berry kind,	17	*Bacciferae*,	Herb-chriſtopher, butcher's-broom, deadly night-ſhade, winter-cherry.
with a membranaceous ſubſtance, that is manifold,	18	*Multiſiliquae*,	Houſe-leek, peony, hellebore, monk's-hood, columbine, fraxinella.
that is ſingle, with one petal,	19	*Monopetalae*,	Hen-bane, ſpeedwell, looſe-ſtrife, mullein, mallow, fox-glove.
with two and three petals,	20	*Di-Tripetalae*,	Enchanter's night-ſhade, marſh-aloe.
with four regular petals,	21	*Siliquoſae*,	Stock, ſatin-flower, ſcurvy-graſs, poppy, rue, epilobium.
with four irregular petals,	22	*Leguminoſae*,	Pea, vetch, lentils, broom, trefoil.
with five petals,	23	*Pentapetalae*,	Pink, lychnis, chickweed, violet.
with graſſy leaves and one or more petals	[illegible]	*Floriferae*,	Hyacinth, narciſſus, tulip, flower-of-a-day, ſow-bread, orchis, ginger.
riſing with one ſeed-leaf, and wanting the petals,	[illegible]	*Stamineae*,	Ruſh, acorus, and the graſſes.
Herbs of uncertain family,	2[illegible]	*Anomalae*,	Water-lily, barren-wort, meadow-rue, pine-apple, pepper, vanelloe.
ſuch as bear Buds, termed Trees; riſing with one ſeed-leaf,	2[illegible]	*Arundinaceae*,	The palms.
riſing with two ſeed-leaves, The flower placed apart from the fruit,	2[illegible]	*Apetalae*,	Fir, pine, cedar, cypreſs, juniper, walnut, oak, cheſnut, poplar.
The flower joined to the fruit, which is crowned with the calyx,	2[illegible]	*Fructu umbilicato*,	Apple, quince, medlar, roſe, honey-ſuckle, hawthorn, elder.
not crowned with the calyx,	3[illegible]	*Fructu non umbilicato*,	Plum, almond, cherry, peach, orange, lemon, calabaſh, arbutus, olive, acajou.
of a dry ſkinny ſubſtance,	3[illegible]	*Fructu ſicco*,	Maple, aſh, lime, tamariſk, elm, lilac, ſumach, tea.
of the pod kind,	3[illegible]	*Fructu ſiliquoſo*,	St. John's bread, oleander, caſſia, tamarind, acacia, broom, laburnum, bladder-ſenna.
Trees of difficult arrangement.	3[illegible]	*Anomalae*,	Fig.

Obſervation.—This method is much to be eſteemed for its approximation to nature. The 1ſt, 3d, 4th, 6th, 11th, 12th, 13th, 14th, 16th, 21ſt, 22d, and 25th claſſes are true natural families.

TOURNEFORT'S METHOD.

This celebrated Method is founded upon the Figure of the Petals, in which Reſpect it is preferable to that of Rivinus and Knaut; Figure being more conſtant than Regularity or Number. According to it, Plants are primarily divided into

- Herbs and under-ſhrubs;
  - Bearing flowers,
    - With petals,
      - The flowers ſimple,
        - Having one petal,
          - that is bell-ſhaped, (1)
          - funnel-ſhaped, (2)
          - of various figures, (3)
          - lip-ſhaped, (4)
        - Having more petals than one,
          - that are croſs-ſhaped, (5)
          - diſpoſed circularly, (6)
          - the flowers growing in umbels, (7)
          - emerging from the tube of the calyx, (8)
          - diſpoſed like thoſe of the lily, (9)
          - ſhaped like a butterfly, (10)
          - of various figures, (11)
      - the flowers compound,
        - with hollow florets, (12)
        - with florets flat above and hollow below, (13)
        - with hollow and flat florets, (14)
    - without petals, (15)
  - not bearing flowers,
    - with ſeeds, (16)
    - without ſeeds, (17)
- Trees and ſhrubs;
  - without petals,
    - the flowers not growing in catkins, (18)
    - the flowers growing in catkins, (19)
  - with one petal, (20)
  - with more petals than one,
    - diſpoſed circularly like thoſe of the roſe, (21)
    - ſhaped like a butterfly, (22)

	CLASSES.	EXAMPLES.
1	*Campaniformes,*	Deadly night-ſhade, gentian, convolvulus, navel-wort, mallow, cucumber, bell-flower, ladies bed-ſtraw.
2	*Infundibuliformes,*	Tobacco, thorn-apple, primroſe, valerian, borage, looſeſtrife, mullein, night-ſhade.
3	*Anomali,*	Arum, Birth-wort, toad-flax, bear's-breech, ſpurge.
4	*Labiati,*	Sage, mint, balm, germander.
5	*Cruciformes,*	Scurvy-graſs, ſtock, alyſſum.
6	*Roſacei,*	Amaranthus, poppy, paſſion-flower, rue, ſaxifrage.
7	*Umbellati,*	Hemlock, chervil, angelica.
8	*Caryophyllaei,*	Pink, lychnis, thrift.
9	*Liliacei,*	Aſphodel, hyacinth, iris, tulip, lily, crown-imperial.
10	*Papilionacei,*	Vetch, lupine, trefoil, pea.
11	*Anomali,*	Balſam, violet, fumatory, dyer's-weed, monk's-hood, fraxinella, orchis, columbine.
12	*Floſculoſi,*	Thiſtle, burdock, tanſy, cud-weed, ſcabious, teazel, globe-amaranth.
13	*Semifloſculoſi,*	Dandelion, goat's-beard, hawk-weed.
14	*Radiati,*	Aſter, golden-rod, groundſel, feverfew, marigold, ſun-flower.
15	*Apetali,*	Aſarabacca, dock, amaranthus, hemp, nettle, and the graſſes.
16	*Spermatophorae,*	The ferns.
17	*Aſpermae,*	Moſſes, muſhrooms, ſea-weed.
18	*Apetali,*	Aſh, box, fig.
19	*Amentacei,*	Walnut, oak, beech, fir, cypreſs.
20	*Monopetali,*	Buckthorn, privet, jeſſamy, olive, lilac, elm, acacia, elder, honey-ſuckle.
21	*Roſacei,*	Sumach, lime, tamariſk, horſe-cheſnut, nettle-tree, ivy, vine, maple, tea, peach, cherry, palms, apple, roſe, myrtle, medlar.
22	*Papilionacei,*	Broom, St. John's-bread, coral-tree, falſe acacia, coronilla.

Obſervation.—The 4th, 5th, 7th, 9th, 10th, 13th, 14th, and 17th claſſes of this method are true natural families.

ANALYSIS of the celebrated SEXUAL SYSTEM of LINNÆUS.

According to this ingenious Method all Vegetables are furniſhed with FLOWERS, *which are either*

- Viſible,
  - Stamina and pointal in the ſame flower,
    - Male and female organs diſtinct,
      - Stamina not united either above or below,
        - Generally of equal length,
          - IN NUMBER (classes 1–13)
        - Of unequal length, (classes 14–15)
      - Stamina united (classes 16–19)
    - Male organs (ſtamina) attached to, and ſtanding upon the female (piſtillum). (class 20)
  - Stamina and pointal in different flowers, (classes 21–23)
- Or lie concealed from view, and cannot be diſtinctly deſcribed. (class 24)

IN NUMBER.	CLASSES.	EXAMPLES.
One, — — —	1 *Monandria,*	Ginger, Indian arrow-root, turmerick, blite.
Two, — — —	2 *Diandria,*	Jeſſamine, privet, olive, lilac, ſpeedwell.
Three, — — —	3 *Triandria,*	Valerian, tamarind, iris, and the graſſes.
Four, — — —	4 *Tetrandria,*	Scabious, teazel, madder, holly, woodroof.
Five, — — —	5 *Pentandria,*	Bell-flower, bind-weed, mullein, thorn-apple, periwinkle, and the rough-leaved and umbelliferous plants.
Six, — — —	6 *Hexandria,*	Snow-drop, narciſſus, tulip, aloe, hyacinth.
Seven, — — —	7 *Heptandria,*	Horſe-cheſnut.
Eight, — — —	8 *Octandria,*	Indian-creſs, heath, French-willow.
Nine, — — —	9 *Enneandria,*	Bay, rhubarb.
Ten, — — —	10 *Decandria,*	Fraxinella, rue, rhododendron, lychnis.
Twelve, — — —	11 *Dodecandria,*	Purſlane, houſe-leek, aſarabacca.
Many, frequently twenty, attached to the calyx,	12 *Icoſandria,*	Peach, medlar, apple, roſe, cinquefoil.
Many, generally upwards of twenty, not attached to the calyx,	13 *Polyandria,*	Herb-chriſtopher, poppy, lark-ſpur, columbine.
Of unequal length: Two long, and two ſhort, —	14 *Didynamia,*	Savory, hyſſop, ground-ivy, balm, toad-flax, fox-glove, agnus caſtus, bear's-breech.
Four long, and two ſhort, —	15 *Tetradynamia,*	Scurvy-graſs, candy-tuft, water-creſs, ſtock, woad.
Stamina united: by the filaments, into one body,	16 *Monadelphia,*	Geranium and the mallow tribe.
into two bodies,	17 *Diadelphia,*	Fumatory, milk-wort, and the pea-bloom flowers.
into many bodies,	18 *Polyadelphia,*	Orange, chocolate-nut, St. John's-wort.
by the anthers or tops, into a cylinder,	19 *Syngeneſia,*	Violet, balſam, cardinal-flower, and the flowers termed compound, as dandelion, ſuccory, thiſtle, cudweed, tanſey, blue-bottle.
Male organs (ſtamina) attached to, and ſtanding upon the female (piſtillum). — —	20 *Gynandria,*	Orchis, ladies-ſlipper, arum, vanelloe, birth-wort, paſſion-flower.
Stamina and pointal in different flowers: on the ſame plant, — —	21 *Monœcia,*	Mulberry, nettle, oak, cypreſs, fir, cucumber.
on different plants, — —	22 *Diœcia,*	Willow, hop, ſpinach, poplar, mercury, juniper.
on the ſame, or different plants along with hermaphrodite flowers,	23 *Polygamia,*	White hellebore, pellitory, orach, fig.
Or lie concealed from view, and cannot be diſtinctly deſcribed. —	24 *Cryptogamia,*	Ferns, moſſes, muſhrooms, flags.

A

BOTANICAL DICTIONARY.

A in compofition fignifies *without*, as *herbæ acalyces*, herbs or plants that want the calyx: *herbæ acaules*, plants that want the *caulis* or ftem.

ACALYCES *Plantæ*, (from *α* priv. and *calyx*), having no calyx, or flower-cup. *Vide* CALYX.

This is the name of the 15th clafs in Wachendorffius's Natural Method, and confifts of fuch plants as have no flower-cup.

ACANACEÆ, the name of the 13th clafs in Cæfalpinus's Syftematic Method, confifting entirely of compound flowers. It anfwers to part of Linnæus's clafs *Syngenefia*, and is exemplified in the dandelion, (*leontodon*). *Vide* SYNGENESIA.

ACAULES *Herbæ*, (from *a* priv. and *caulis*); herbs that want the *caulis* or ftem. The 20th clafs, or family, in Magnolius's Method. *Vide* CAULIS.

ACINI, the fmall berries which compofe the fruit of a mulberry, bramble, ftrawberry, &c.

ACOTYLEDONES, (from *α* priv. and *cotyledon*); plants fo called whofe feeds are not furnifhed with *cotyledons*, or lobes, and confequently, put forth no feminal leaves. All the moffes are of this kind. *Vide* COTYLEDONES.

ACULEUS, (from *acus*, a needle, of which Prifcian confiders it, as well as *acicula*, to be a diminutive, all of them, probably, derived from the Greek ἀκη, or ἀκις, *cufpis*, a point); a prickle, or fharp point. A fpecies of armature, or offenfive weapon, with which the ftems and branches of

 feveral

ſeveral plants are furniſhed. *Vide* ARMA. It is particularly remarkable in roſe, raſpberry, currant, and berberry buſhes.

The prickle differs from the thorn *(ſpina)*, another ſpecies of armature, or defence againſt animals, in being only a prolongation of the *cortex* or outer bark of the plant, and in no ſort connected with, or protruded from the wood. This is apparent from the facility with which ſuch prickles are detached from the ſtem along with the bark: whilſt the other, and more rigid ſpecies of weapon, being an expanſion or proceſs of the lignous body, cannot be detached without rending and tearing the ſubſtance of the wood. *Vide* SPINA.

Duhamel compares prickles on the ſurface of plants, to the nails and claws of animals.

Prickles are either,

Recti, ſtraight; as in *ſolanum indicum*;

Incurvi, bent inwards; as in *mimoſa cineraria;*

Recurvi, bent outwards.

Tomentoſi, downy, or covered with *tomentum*, a ſilver-white woolly appearance, as in the *ſolanum ſanctum*. *Vide* TOMENTUM.

Aceroſi, chaffy; *ſolanum tomentoſum*.

Geminati, growing in pairs; as in *euphorbia canarienſis*, and *euphorbia officinarum*.

ADVERSIFOLIÆ *Plantæ*, (from *adverſus*, oppoſite; and *folium*, a leaf); plants whoſe leaves ſtand oppoſite to each other, on the ſame ſtem or branch. The name of the 5th claſs in Sauvage's *Methodus Foliorum*, exemplified in valerian, teaſel, honey-ſuckle, and the labiated, or lipped flowers. *Vide* LABIATUS *Flos*.

ÆSTIVALES *Plantæ*, (from *æſtas*, ſummer); plants which flower in ſummer. The ſecond diviſion or claſs of Du Pas's Method or arrangement from the four ſeaſons of the year, conſiſting of herbs which flower in ſummer.

AFORA, from *a* priv. and *fores*, a door); having no doors or valves. The name of a claſs in Camellus's Method, conſiſting of plants whoſe pericarpium or ſeed-

veſſel

vessel is not furnished with the inclosure or external covering called a valvule. *Vide* VALVULA.

AGGREGATUS *Flos*, (from *aggregare*, to assemble, or collect); properly signifies a flower consisting of a number of smaller flowers, or fructifications, collected into a head by means of some part common to them all. In this view, aggregate flowers stand opposed to simple flowers, which have a single fructification, compleat in its parts, none of which are common to many flowers.

From the description of aggregate flowers, just given, it is evident that each of the smaller flowers will not constitute a complete fructification of itself; as one or two of the essential parts of fructification are only common to the whole bundle or heap. It happens, however, sometimes, that the partial flower will be furnished with a part analogous to the common part in the aggregate. Thus in compound flowers, (the *Syngenesia* of Linnæus), the florets or partial flowers are generally furnished with a proper calyx or flower-cup, though the calyx is one of the common parts in such compound flowers. The same thing occurs in several other aggregate flowers, which are not compound. Thus thrift, or sea-pink, *statice*; scabious, *scabiosa*; teasel, *dipsacus*; blue-daisy, *globularia*; button-wood, *cephalanthus*; hartwort of Crete, *tordylium*; hog's-fennel, *peucedanum*; laserwort, *laserpitium*; lovage, *ligusticum*; pistacia-nut, *pistacia*; &c. are furnished with a common and proper calyx. On the other hand, Leucadendron, silver tree, *protea*; carrot, *daucus*; cowparsnep, *heracleum*; carvy, *carum*; dill, *anethum*; parsley, *apium*; &c. though furnished with a common calyx, under different appellations, have scarce any proper flower-cups for the different florets, of which the aggregate is composed.

The common part in aggregate flowers, is either the receptacle, or the calyx. *Vide* RECEPTACULUM, and CALYX.

From the different structure, disposition, and other circumstances of these common parts, arises a sevenfold division of aggregate flowers: the *aggregate*, properly so called; the

 compound,

compound, the *umbellate*, the *cymose*, the *amentaceous*, the *glumose*, and the *spadiceous* flowers. *Vide* Compositus *Flos*, Umbella, Amentaceus *Flos*, *&c.*

These all agree in being composed of florets, called by Linnæus, *flosculi*, which are connected by means of some part or parts common to the whole; but differ in the figure, proportion, and disposition of these parts.

The Aggregate Flower properly so called, has its florets erected on peduncles or foot-stalks: the receptacle, which is common, being dilated, or extended in breadth for that purpose. The calyx is likewise common, and universally that species called perianthium. In some flowers, each floret has a proper calyx, which is likewise a perianthium, and generally monophyllous, or of one piece. In others, there is either no proper calyx at all, as in *leucadendron*; or it is so very small, as scarcely to be discerned: as in teasel.

Striking Structures.

Scabious, *scabiosa*; has a double proper calyx.

The genus *mitchella* has two distinct flower-cups, and two florets placed upon a single germen, or fruit-bud.

The genus *morina* has likewise a double perianthium, each perfectly distinct, the one of the flower, and the other of the fruit.

Valerian, button-wood, and American hog-weed, *boerhavia*, have scarce any common calyx.

In the genus *brunia*, the proper calyx or perianthium is pentaphyllous, or consists of five distinct leaves.

These are the most remarkable exceptions to the general description of aggregate flowers, properly so called.

Aggregatæ, the seventh class in Royen's Natural Method; and forty-eighth order in Linnæus's *Fragmenta Methodi Naturalis*, consisting of plants whose flowers answer to the description given above.

It may not be improper here, to observe, that these Fragments of a Natural Method, have undergone several alterations since their first publication in the *Philosophia Botanica*. The number of orders, then sixty-eight, is now reduced to fifty-

fifty-eight; and besides, that the names and places of these orders have undergone a total revolution; several genera, that formerly were ranked under one title, are now dispersed among a number of different titles or orders. To avoid confusion, therefore, let the reader keep in mind, that the Fragments I always refer to, are those published at the end of the sixth edition of the *Genera Plantarum*, printed Holmiæ, 1764, under the head *Ordines Naturales*.

To illustrate the above observation, I would remark, that these genera, *lonicera*, honey-suckle; *mitchella*, *morinda*, and *loranthus*, are removed into the order *aggregatæ*, which we are now considering, from an order entitled *cymosæ*, which is not to be found in the improved editions of the Fragments. In like manner, the genera *selago*, *conocarpus*, button-tree; and *viscum*, missletoe; which were formerly thrown into the last order, as vague, and of difficult arrangement, now make a part of the same order of aggregate flowers.

ALA, a wing; so the word literally signifies. Among former botanists, it was used to express the angle formed by the stem with the branch or leaf.

With Linnæus, and others, *ala* is the name of a membrane, affixed to some species of seeds, and which, by its flying, helps to disperse them. *Vide* SEMEN.

Examples of the winged seed will be found in the fir, birch, and tulip-trees, *liriodendrum*; in the aggregate flower button-wood, *conocarpus*; and the umbelliferous flowers, *artedia*, and dill, *anethum*.

Meadow-rue, *thalyctrum*; trumpet-flower, *bignonia*; red jasmine, *plumeria*; tickseed, *corispermum*; and queen's-july-flower, *hesperis*; are also furnished with seed-membranes of this kind.

ALÆ, the two lateral, or side petals of a papilionaceous, or butterfly shaped flower. *Vide* COROLLA, and DIADELPHIA.

ALBURNUM, (from *albus*, white); the soft white substance, which, in trees, is found between the *liber* or inner bark and the wood, and, in progress of time, acquiring solidity, becomes itself the wood. From its colour, and comparative

parative foftnefs, it has been ftiled by fome writers, the fat of trees, *adeps arborum*.

The *alburnum* is found in largeft quantities in trees that are vigorous; though in fuch as languifh, or are fickly, there is a greater number of beds. In an oak fix inches in diameter, this fubftance is nearly equal in bulk to the wood. In a trunk of one foot diameter, it is as one to three and a half; of two and a half feet diameter, as one to four and a half, &c. but thefe proportions vary according to the health and conftitution of the trees.

The *alburnum* is frequently gnawed in pieces by infects, which lodge in the fubftance, and are nourifhed from it.

ALGÆ, flags; one of the feven families, or natural tribes, into which the whole vegetable kingdom is divided by Linnæus, in his *Philofophia Botanica*. They are defined to be plants, whofe root, leaf and ftem, are all in one. Under this defcription are comprehended all the fea-weeds, and fome other aquatic plants.

In the fexual fyftem, they conftitute the third order of the twenty-fourth clafs *Cryptogamia*; in Tournefort's, the fecond genus of the fecond fection, (*Marinæ, aut fluviatiles*,) of the feventeenth clafs, *afpermæ vulgo habitæ*; and the fifty-feventh order in Linnæus's Fragments of a Natural Method.

The difcoveries made in this part of the vegetable kingdom, are uncertain, and imperfect; and the attempts, in particular, to arrange flags by the parts of the fructification, have not been attended with great fuccefs. Dillenius has arranged this order of plants, from their general habit and ftructure; Micheli from the parts of fructification.—— Each has confiderable merit.

ALOPECUROIDEA, (from *alopecurus*, fox-tail grafs); the name of a clafs, in Ray's, Montis, and Scheuchzerus's Divifion of the Graffes.

ALTERNÆ *Plantæ*, the name of the third and fourth claffes of Sauvage's *Methodus Foliorum*, confifting of plants whofe leaves are alternate: oppofed to the clafs *Adverfifoliæ* of the fame author. *Vide* ADVERSIFOLIÆ *Plantæ*.

AMARÆ *Herbæ*, bitter herbs; the name of a divifion or

clafs,

clafs, in Hernandes, and other botanifts, who have arranged plants according to their fenfible qualities.

AMENTACEUS *Flos*, (from *amentum*); having that fpecies of calyx, called *amentum*. *Vide Infra*.

All amentaceous flowers are aggregate. *Vide* AGGREGATUS *Flos*.

An amentaceous aggregate flower has a filiform, or thread-fhaped receptacle, along which are difpofed amentaceous *fquamæ*, that is, fcales forming an amentum, thong, or catkin.

The willow-tree, *falix*; birch, *betula*; beech, *fagus*; poplar, *populus*; hazel, *corylus*; horn-beam, *carpinus*; fir, *pinus*; walnut, *juglans*; oak, *quercus*; fig-tree, *ficus*; cyprefs, *cupreffus*; and other trees, are amentaceous.

It does not appear abfolutely neceffary for a flower of this kind to have an amentum for its calyx. In fact, the leffer burdock; the genus *ambrofia*; baftard-feverfew, *parthenium*; Jefuit's-bark-tree, *iva*; pellitory, *parietaria*; the nettle, *urtica*; &c. which are reckoned by Linnæus among the amentaceous flowers, have either a perianthium or involucrum for their calyx. *Vide* PERIANTHIUM and INVOLUCRUM.

The greateft part of the amentaceous flowers, belong to one of the claffes *Monœcia*, or *Diœcia* of Linnæus. *Vide* MONŒCIA, DIŒCIA.

Befides the common amentum, feveral of the amentaceous flowers have a proper calyx or perianthium; as *cynomorium*; burr-reed, *fparganium*; fand-box-tree, *hura*; piftacia nut, *&c.* and many others.

AMENTACEÆ, the thirty-fecond clafs of Boerhaave's Method, and nineteenth of Tournefort's, comprehending trees only. In Linnæus's *Methodus Calycina*, it is the third clafs; in his Fragments, the fiftieth order; and in Royen's Natural Method, the fourth clafs.

It is not eafy to give an exact defcription of the idea Linnæus feems to have affixed to amentaceous plants; for, in the *Philofophia Botanica*, (as we have obferved in the preceding article,) he calls feveral flowers amentaceous, which have not an *amentum* for their calyx; and, in his fragments

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of a Natural Method, the order *amentaceæ* does not contain the cypreſs, juniper, arbor vitæ, *thuja*; ſand-box-tree, and other conebearing-trees, whoſe calyx is an amentum.

In Boerhaave and Tournefort's Method, as we have remarked above, the term *amentaceous* reſpects trees only. In the latter, the claſs *amentacei* conſtitutes the ſecond diviſion of apetalous trees; that is, of trees wanting the petals, or coloured leaves; and conſiſts of flowers, attached in a bundle, or heap, round a common thread, or ſlender receptacle; which thread is deſcribed under the name of

AMENTUM, catkin; (derived by Feſtus from the Greek *ἅμμα, vinculum ſive nexus*, a bond or thong,) a ſpecies of calyx, conſiſting of a great number of chaffy ſcales, diſperſed along a ſlender thread, or receptacle, which, from its reſemblance to a cat's tail, has obtained, in Engliſh, the name of catkin; in French, *chaton*; and by many botaniſts, the ſimilar appellation of *catulus*. The term *amentum* is uſed by Tournefort and Linnæus, and is ſynonimous to *julus*, *nucamentum*, and *catulus*, in other writers. *Vide* CALYX.

An amentum, as defined by Linnæus, is a compoſition of a calyx, and a common receptacle. The *ſquamæ*, or ſcales, that form the amentum, mix alternately with the flowers, and reſemble the chaff in an ear of corn.

This ſpecies of calyx occurs frequently in the claſſes *Monœcia*, and *Diœcia* of Linnæus; that is, it is found to ſupport male and female flowers, that grow either on the ſame root, as in the former claſs, or on two diſtinct roots, as in the latter.

In the horn-beam, *carpinus*; an amentum ſupports both male and female flowers, on the ſame root.

In the willow, *ſalix*; and the poplar, *populus*; an amentum ſupports male and female flowers on diſtinct roots.

Male and female flowers, when produced from the ſame root, are ſometimes mixed together, ſometimes placed at a conſiderable diſtance on the ſame plant. In the latter caſe, it is not uncommon to find an amentum ſupporting the flowers of one ſex, and a perianthium thoſe of the other. This

is

is exactly what happens in the hazel-nut, *corylus*; where the male and female flowers are removed from each other on the same plant. The male flowers form an amentum; the female flowers are inclosed by a perianthium. In like manner, the walnut-tree, *juglans*; and the sand-box tree, *hura*; have on the same root their male flowers, with an amentum; their female flowers with a perianthium.

Arbor vitæ, *thuja*; and the cypress tree, have, upon the same root, the male flowers formed into an amentum, and the female flowers into a cone. *Vide* CONIFERÆ.

In plants that have male and female flowers on distinct roots, *Diœcia*; the pistacia-nut has its male flowers only formed into an amentum; a perianthium surrounding the female. The same thing happens in the juniper-tree, and shrubby-horse-tail, *ephedra*.

Flowers that are supported by an amentum, whether male or female, or both, generally want the petals, or coloured leaves. *Vide* COROLLA. This observation is exemplified in the oak, beech, hazel, cypress, pistacia-nut, and several others.

The following are exceptions to the general rule.

In the genus *carex*, which has male and female flowers produced on the same root, the female flowers have a *nectarium*, but no petals: the male flowers have neither petals nor *nectarium*. *Vide* NECTARIUM.

The contrary of this takes place in the willow, *salix*; where the male and female flowers are produced on distinct roots. The male flowers have a *nectarium*, and want petals; the female want both.

In the poplar-tree, *populus*, both male and female flowers want petals, and are furnished with a *nectarium*.

The male flowers of the birch-tree have a proper corolla, consisting of one petal, deeply divided into four parts. The female flowers have no corolla that is perceptible.

Both male and female flowers of the walnut-tree, *juglans*, are furnished with a corolla; but this corolla is cut into six parts in flowers of the former sex; into four in those of the latter.

Horn-beam, *carpinus*; whoſe male flowers want the corolla, has its female flowers furniſhed with one in the form of a calyx, conſiſting of one piece, divided into ſix parts.

The male flowers of the juniper-tree have no corolla. The female have three rigid petals, which continue till the fruit is arrived at maturity.

ANDROGYNA *Planta*, (from ἀνηρ, a man, and γυνὴ, a woman); a plant is ſaid to be androgynous, which produces both male and female flowers from the ſame root; as the walnut, birch, hornbeam, nettle, oak, cheſnut, fir, box, mulberry, hazel, cypreſs, cat's tail, *typha*; plane tree, and many others.

N. B. The nettle and mulberry, produce male and female flowers, either on the ſame, or diſtinct plants. *Vide* MASCULUS *Flos*, and FEMINEUS *Flos*.

Androgynous plants conſtitute the claſs *Monœcia* in Linnæus; *vide* MONŒCIA; and have frequently an amentum for their calyx. *Vide* AMENTUM.

ANGIOSPERMÆ *Herbæ*, (from ἀγγος, a veſſel, and σπερμα, a ſeed); herbs, whoſe ſeeds are incloſed in a covering, or veſſel; in oppoſition to *gymnoſpermæ*, where the ſeeds are placed naked in the bottom of the flower-cup, without any other external covering whatever. In this view, Hermannus divides all ſuch herbs as are furniſhed with petals, into *gymnoſpermous* and *angioſpermous*.

The firſt ſeven claſſes exhauſt the diviſion ariſing from the number, *&c.* of naked ſeeds: from the eighth claſs to the eighteenth incluſive, the herbs are *angioſpermous*, or furniſhed with a ſeed veſſel. The different ſtructure of ſuch ſeed-veſſels, their number, and other circumſtances, ſuggeſt very properly the diviſion into claſſes. Thus the ſeed-veſſel in ſome plants is dry, and hard, and denominated a capſule; in others, it is a pod, as in the pea, bean, cabbage; in ſome a berry; in ſome, a fleſhy, or pulpy ſubſtance, containing a capſule; as the apple, pear, *&c.* in others, a fleſhy or pulpy ſubſtance, containing a ſtone; as the cherry, plumb, peach. Again, ſome plants have only one capſule; others have two, three, or more. It is evident

evident what beautiful divifions muft naturally arife from a view of the whole vegetable kingdom in this way. In fact, the greateft number of Hermannus's claffes are true natural affemblages; whilft the fo much boafted fyftem of Linnæus, feparates things that ought never to be disjoined, and brings together fuch as agree in nothing but the fingle circumftance that is the foundation of his method.

ANGIOSPERMIA, the name of the fecond order in the clafs *Didynamia* of Linnæus. *Vide* DIDYNAMIA.

Hermannus, we have feen, ufed this term in its moft extenfive fenfe. Linnæus, the profeffed reformer of botanical language, has reftricted it to a few genera of plants, in a clafs, whofe characteriftic it is to have four ftamina, two of which are long, and two fhort. *Vide* STAMINA.

For the particular claffical characters of *Didynamia*, fee the term itfelf.

With refpect to this order, *Angiofpermia*, the only effential character is, that the feeds are placed in a *pericarpium*, or veffel; a character which is conftant, and diftinguifhes this order from the other, *Gymnofpermia*, under every form.

The genus *felago*, indeed, has no proper *pericarpium*; but its fingle feed, inftead of being lodged in the bottom of the calyx, as in the order *Gymnofpermia*, is involved, or infolded by the corolla; the tube, or lower part of which is fmall, and narrowed for that purpofe.

The ftigma, in this order, is generally obtufe. *Vide* STIGMA.

Exceptions.—Fox-glove, *digitalis*; american-viburnum, *lantana*; bear's-breech, *acanthus*; *torenia*, *felago*, and *oviedo*, have an acute ftigma.

The corolla is univerfally monopetalous, both in this and the other order, except in the genus *melianthus*, honey-flower; which has four petals, and a nectarium of one leaf.

The corolla too, is generally ringent, or gapes.

In figwort, *fcrophularia*; fox-glove, *digitalis*; *felago*, and fome other genera which belong to this order, the corolla fpreads at the top.

Many plants of this order, have a double ftigma. Take the

the following examples: broom-rape, *orabanche*; oily purging-grain, *ſeſamum*; chaſte-tree, *vitex*; *mimulus*, *&c.*

From the reſemblance which the corolla of the plants of this order bears to a maſque, Tournefort has diſtinguiſhed them by the name of *perſonati*, that is maſqued flowers; which conſtitute the third claſs in his ſyſtem. *Vide* PERSONATUS *flos*.

The order *Angioſpermia* is ſynonimous to *Perſonatæ*, the fortieth order of Linnæus's Fragments, and makes part of the twelfth claſs *Ringentes*, in Royen's Natural Method. It is however to be obſerved, that Linnæus's Natural Order, *Perſonatæ*, contains ſeveral genera that do not belong to the ſecond order of the claſs *Didynamia*, in his Sexual Syſtem: as ſpeedwell, *veronica*; malabar-nut, *juſticia*; hedge-hyſſop, *gratiola*; vervain, *verbena*; which belong to the ſecond claſs, *Diandria*.

The term angioſpermous, is equivalent to Rivinus's *Semina tecta Pericarpio*, ſeeds covered with a pericarpium.

ANGULI *Folii*, the prominent parts of an horizontal leaf. *Vide* FOLIUM.

ANOMALÆ, (from α priv. and νομ☉, a law); irregular: the name of the twenty-ſixth and thirty-third claſſes in Ray's Method; the former, reſpecting herbs; the latter, trees. The eleventh claſs in Tournefort's Method, has alſo obtained this name, and conſiſts of plants whoſe corolla is compoſed of ſeveral irregular and diſſimilar pieces. The aconite, columbine, violet, fumatory, lark-ſpur, orchis, fraxinella, and ſeveral other plants, which have a *nectarium*, are reduced to this claſs of Tournefort. *Vide* NECTARIUM.

Anomalæ is likewiſe the name of the fourth, thirteenth, and twenty-ſecond claſſes of Pontedera's Syſtem, and the ninth of Linnæus's *Methodus Calycina*, or method derived from the form, ſtructure, and ſituation of the calyx.

ANTHEMIDES, the name of the eleventh claſs, in Cæſalpinus's Syſtem: containing a number of plants, which are furniſhed with ſeveral naked ſeeds within a common calyx, each petal or floret having a ſingle ſeed. It anſwers to part of the *ſyngeneſious*, or compound flowers of Lin-

næus;

næus; and is exemplified in the daiſy, *bellis*. Cæſalpinus's twelfth claſs, *Acanaceæ*, or *Cichoraceæ*, contains the remaining part of the compounded flowers. *Vide* ACANACEÆ, *&c.*

ANTHERA, (from ἀνθ☉, a flower); the *Apex* of Ray, Tournefort, and Rivinus; the *Capſula Staminis* of Malpighi. *Vide Philoſophia Botanica*, page 134. The anther, ſummit, or top of the ſtamen, connected with the flower, and elevated by means of the filament, or thread. *Vide* STAMEN, and FILAMENTUM.

From the great utility of the fine coloured duſt contained within this part of the fructification, Linnæus has diſtinguiſhed it by the name of *anthera*, or, *the flower* by way of eminence.

The duſt, which he has denominated *Pollen*, is diſcharged, when ripe, for the impregnation of the plant, by the anther, which ſwells and burſts open for that purpoſe. *Vide* POLLEN.

This is a leading principle in the celebrated Sexual Syſtem of Linnæus.

Natural Structure.

The moſt natural ſtructure of the Anther, by which I always mean the moſt common, or that which is found to obtain in the greateſt number of plants, is, in point of ſituation, to be placed on the top of the filament; in point of number a ſingle anther to each filament.

Different ſtriking Structures.

We obſerved above, that the generality of plants have a ſingle anther to each filament; the following are exceptions to the general rule.

The herb mercury, *mercurialis*; and ranunculus, have two anthers to each filament; this is ſtyled by Linnæus, *anthera didyma*; and is frequently found in the claſs *Monœcia*.

Fumatory, *fumaria*; has three anthers to each filament.

Bryony, *bryonia*; has five anthers to three filaments; a ſingle

ſingle anther upon one of the filaments, and the remaining four equally divided between the other two.

The chocolate-nut, *theobroma*; has five anthers to each filament.

The bean, pea, vetch, furze, trefoil, liquorice, and all the other butterfly-ſhaped flowers (the *Diadelphia* of Linnæus) have generally ten anthers to two filaments, or, more properly, to two ſets of united ſtamina.

The gourd, *cucurbita*, has one anther, common to three filaments.

Dandelion, feverfew, groundſel, and all the other compound flowers, (the *Syngeneſia* of Linnæus) have one anther, common to five filaments; or, to ſpeak more properly, five anthers united in a cylinder, are placed upon five diſtinct and ſeparate filaments.

The genera *chelone* and *martynia*, which belong to the claſs *Didynamia* of Linnæus, and conſequently have four ſtamina, two of which are long, and two ſhort, are very ſingular in their ſtructure. Within the uppermoſt, or talleſt pair of ſtamina, is placed the rudiment of a fifth filament, ſharp and pointed, without an anther.

Vervain, *verbena*, though of the claſs *Diandria*, has four filaments, two ſhorter than the reſt, and but two anthers. Some ſpecies of vervain have four anthers.

Hedge-hyſſop, *gratiola*, likewiſe of the claſs *Diandria*, has four filaments; two ſhorter than the reſt and barren; that is, without anthers. In ſome ſpecies, three anthers are wanting.

In a ſpecies of the trumpet-flower, *bignonia*, called by Linnæus *catalpa*, there are only two perfect ſtamina, or ſtamina with anthers. The three remaining rudiments of ſtamina, are ſhorter than the other two, and want the anthers.

Turmerick, *curcuma*; of Linnæus's firſt claſs, *Monandria*; has five ſtamina, four of which are imperfect, or, according to Linnæus, caſtrated; that is, want the anthers.

Some ſpecies of *geranium*, particularly that called by Linnæus *Cicutarium*, have the filaments furniſhed alter-

nately only with anthers; that is five anthers to ten filaments.

The anthers, we obſerved, are generally ſeated on the tops of the filaments.

The herb *paris*, and aſarabacca, *aſarum*, have the anthers fixed to the middle or ſides of the filaments.

Birthwort, *ariſtolochia*, has no filaments; the anthers, which are ſix in number, adhere to the ſtigma.

In cuckow-pint, *arum*, there are likewiſe no filaments, unleſs a number of nectaria, thick at the baſe, and terminated with thread-ſhaped tendrils. The anthers are numerous, four-cornered, placed between a double row of tendrils, and adhere to the receptacle, which, in this genus, is a *ſpadix*. *Vide* SPADIX.

The anthers are generally furniſhed with one or more cells, (*loculi*,) for containing the fine duſt, or vivifying powder mentioned above.

Mercury has one cell.

Hellebore, has two cells.

Orchis, three; and

Fritillaria, four.

The powder, when ripe, is diſcharged by the anther, which burſts, either on the ſide, as in moſt flowers; on the top, or apex, as in ſnow-drop; or through the whole length downwards, as in barren-wort, *epimedium*; and lion's leaf, *leontice*.

This burſting of the anthers, is ſtiled by Linnæus, *Dehiſcentia*; and where the opening is very minute, as in ſome ſpecies of anthers, it is termed APERTURA.

Terms expreſſing the mode of connection of the Anthers with the Filament.

ANTHERÆ ERECTÆ, erect, or ſtraight anthers; when they are faſtened by either extremity to the top of the filament; by the baſe, as in moſt plants; or by the top, as in meadow-ſaffron, *colchicum*.

ANTHERÆ INCUMBENTES, anthers which lie upon the filaments, or are faſtened to them by the ſides; oppoſed to *erectæ*.

This

This term is exemplified in the ſea-pink, *ſtatice*; the currant-tree, *ribes*; the pink, *dianthus*; ſea-daffodil, *pancratium*, &c.

ANTHERÆ VERSATILES, veering about like a vane, or weather-cock; when they are placed horizontally on the top of the filament, and conſequently ſo poiſed, as to turn on it like a vane, or the needle of a compaſs. Exemplified in cock's-comb, *celoſia*; *geranium*, *clutia*, *amaranthus*, and *eriocaulon*.

Note, the verſatile anther, is a ſpecies of the incumbent.

Indian flowering-reed, and the genus *coſtus*, have their anthers incumbent, or attached by the ſides, not to a filament, but to a nectarium, the upper-lip of which ſerves in the laſt genus, inſtead of a filament.

Terms of Figure and Reſemblance.

Anthera Linearis, ſmall, and ſlender, like a line; as *heliocarpus*, *ſtapelia*, &c.

Anthera Subulata, awl-ſhaped, or narrowing towards the top; as in the genus *roella*.

Anthera Haſtata, like a ſpear, or javelin, as in the genus *jacquinia*.

Anthera Oblonga, of an oblong figure, or much longer than broad; as in the capſicums, blood-flower, *hæmanthus*; and evolvulus.

Anthera Bicornis, with diviſions like two horns; as in winter-green, *pyrola*; whortle-berries, *vaccinium*.

Anthera Bifida, parted half-way down in two; as in heath, *erica*.

Anthera Biloba, parted more than half-way down in two, with wide and concave diviſions, as in eye-bright.

Anthera Sagittata, arrow-ſhaped; as in crocus, flax, *linum*; and the pine-apple, *bromelia*.

Anthera Cordata, heart-ſhaped; as in ſweet-weed, *capraria*; *tinus*, *bucida*.

Anthera Reniformis, kidney-ſhaped; as in *ginora*, and *tradeſcantia*.

The kidney-ſhaped anther, as well as the kidney-ſhaped ſeeds, is very common in the claſs *Monodelphia* of Linnæus.

Anthera Ovata, egg-ſhaped; as in *limeum*.

Anthera Subovata, nearly approaching to the egg ſhape, as in ſparrow-wort, *paſſerina*.

Anthera Rotunda and *Globoſa*, though diſtinguiſhed by Linnæus, ſeem to be of equal import; round, or without any angles: *calamus*, a genus of the *Hexandria* of Linnæus, furniſhes an example of the former term; the herb mercury, *mercurialis*, of the latter.

Anthera Subrotunda, roundiſh, or a little round: as in louſe-wort; ceraſtium; american viburnum, *lantana*; orach, *atriplex*; american night-ſhade, *phytolacca*; baſtard milk-vetch, *phaca*.

Anthera Trigona, three-cornered; as in the roſe.

Anthera Tetragona, four-cornered; as in hemp, *cannabis*; the poplar, *populus*; and fraxinella, *dictamnus*.

Anthera Lunulata, and *Lunularis*, creſcent-ſhaped; as in the ſtrawberry, and marſh cinquefoil, *comarum*.

Theſe are the moſt remarkable terms for expreſſing the ſhape and figure of the anthers; to particularize them all, with the minute exactneſs of Linnæus, in his Genera Plantarum, would be endleſs, and, indeed, is altogether unneceſſary.

The following terms relating to the anther, cannot be diſpoſed under any particular head.

Anthera Acuta, ſharp, or terminating in an acute angle; as in comfrey, *ſymphytum*; and honey-wort, *cerinthe*.

Anthera Acuminata, tapering to a point; as in fox-glove, *digitalis*; and *thlaſpi*.

Anthera Obtuſa, blunt, oppoſed to the two former; as in herb bennet, *geum*; bear's breech, *acanthus*.

Anthera Diſtincta, diſtinct, or unconnected with each other; as in moſt plants.

Anthera diſtans, a term expreſſing the remoteneſs of the anthers from each other; as in the genera *ziziphora* and *morina*.

Anthera Connivens, approaching, or inclining towards each other, oppoſed to the two former; as in lung-wort, *pulmonaria*; borage, *borago*; night-ſhade, *ſolanum*; and ſeveral

 genera

genera of the clafs *Didynamia*, of Linnæus; as fnap-dragon, *antirrhinum*; ground-ivy, *glecoma*; favory, *fatureia*, &c.

Anthera Connata, Cohærens, united together; as in water milfoil, *utricularia*.

Anthera Incurva and *Incurvata*, bowed, or crooked; as in vervain, *verbena*; and filk cotton-tree, *bombax*.

Anthera Villofa, covered with foft hairs, woolly; as in bear's-breech, *acanthus*.

Anthera Hirfuta, rough with hair, as in the dead nettle, *lamium*; and elephant's-head, *rhinanthus*.

Anthera Membranacea, hard like parchment; as in the genus *triplaris*.

Anthera Pellucida, fhining, or tranfparent; as in moon-feed, *menifpermum*. This tranfparency is obferved in the barren anther of the female flower only; for this genus of plants belongs to the clafs *Diœcia* of Linnæus, and confequently, has its male and female flowers upon diftinct roots. *Vide* MASCULUS and FEMINEUS *Flos*.

Principles of the Sexual Method.

1. Every vegetable is furnifhed with flower and fruit. *Vide* FLOS, and FRUCTUS.

2. The flower and fruit together conftitute the fructification. *Vide* FRUCTIFICATIO.

3. The fructification, therefore, is the effence of the vegetable.

4. The effence of the flower confifts in the anther and ftigma. *Vide* STIGMA.

5. The anther, and ftigma, therefore, conftitute a flower, with or without the calyx and corolla. *Vide* CALYX and COROLLA.

6. The anther produces, and, when ripe, difcharges a powder called *pollen*, which, falling upon the ftigma, is abforbed by a tough and vifcid humour, with which the furface of that part is covered; and paffing through the ftyle which correfponds to the vagina in animals, difcharges what Linnæus calls the *aura feminalis*, for the impregnation of the germen, or ovarium below. *Vide* STYLUS and GERMEN.

7. To ſpeak, by analogy, therefore, the anthers may be conſidered as the teſtes; the pollen contained within them, as the *ſemen maſculinum*, or male ſeed; and the filament, which elevates the anthers, as the ſpermatic veſſels. *Vide* POLLEN and FILAMENTUM.

8. The ſtigma is to be conſidered in general, as the female organ of generation in plants.

Arguments in ſupport of the opinion that the Anther is the male organ of generation in plants.

1. The flower univerſally precedes the fruit, as generation and conception precede the birth. I ſay univerſally, becauſe the few inſtances which ſeem to contradict this aſſertion, are found, upon examination, to be exceptions in appearance only.

Meadow-ſaffron, *colchicum*; and witch-hazel, *hamamelis*; flower in autumn, and produce fruit the following ſpring: —a ſingular fact in vegetation, and which, to an inattentive obſerver, might ſuggeſt the opinion, that, in theſe plants, the flower is preceded by the fruit.

In the plantain-tree, *muſa*; the germen, or ſeed-bud, which is very large, has attained its full-growth, but not maturity, before the male flowers appear. The fruit, therefore, does not precede the flower, even in this inſtance, where the germen is not impregnated by the male duſt.

2. Another argument for the ſexes of plants, is derived from the ſituation and proportion of the ſuppoſed organs of generation, the anthers, and ſtigma.

In an erect, or upright flower, the anthers and ſtigma are either of equal length, as in moſt plants; or the anthers are conſiderably taller, that the duſt, when diſcharged, may fall upon the top of the ſtigma.

In an inverted flower, (*flos nutans*,) the female organ is longer than the male, for the ſame reaſon. Of this we have familiar inſtances in the ſnow-drops, campanulas, and fritillarias. It is obvious, that if the ſtamina were longer than the piſtillum, or female organ, in ſuch plants, no impregnation could ever, on the hypotheſis of Linnæus, poſſibly en-

ſue:

fue: as the duft, when ripe and difcharged, would fall to the ground, and never approach the ftigma, which lies in the oppofite direction.

In flowers that flope downwards, or droop, both organs incline towards the under fide; and the anthers are generally placed immediately above the ftigma. Wild fenna, *caffia*; and all the butter-fly fhaped flowers, the *Diadelphia* of Linnæus, furnifh examples.

In flowers that flope upwards, (*flos adfcendens*); both organs are placed clofe under the upper fide; as in the *Didynamia Gymnofpermia* of Linnæus.

Thus we have feen, that the piftillum, in every inftance, follows the direction of the anther; that its length is likewife regulated by the male organ; and that the fine duft difcharged by the anthers does, in effect, fall upon the ftigma.

In the pink, *dianthus*, the flyle is generally longer than the ftamina: and the ftigma is bent backwards, to receive the pollen, which otherwife would efcape. In fome fpecies, the flyles are exceedingly long, but are fo rolled back, that the impregnation by the male duft can eafily be accomplifhed without the inflection of the flower.

The long flyles in the fennel-flower, *nigella*, are likewife rolled back for the fame purpofe.

Hitherto we have treated of the fituation of the anthers and ftigma, when they are placed within the fame covers, and form together a fructification, which is termed by Linnæus an hermaphrodite flower.

The fituation of thefe effential parts of fructification, is not lefs favourable to the hypothefis of the fexes, when they are placed within diftinct covers, upon the fame root, as in the clafs *Monœcia* of Linnæus, where the flowers that have the anther only, which he calls male-flowers, are generally placed immediately above the female-flowers, or fuch as have the piftillum only; and that, either upon the fame, or different foot-ftalks. Thus in the genera *zea*, and *coix*, Job's-tears, the male-flowers, or thofe furnifhed with the anthers, are placed above the female-flowers, upon different fpikes in the former, and upon the fame fpike in the latter. *Vide* SPICA.

Exception.

Exception.—The genera *olyra*, *zizania*, and *poterium*, garden-burnet, have the male-flowers placed below the female; the two former on the fame panicle; the latter on the fame fpike. *Vide* PANICULA.

In compound flowers, the *Syngenefia* of Linnæus, there are few barren plants, or that do not ripen feed; a circumftance which Linnæus accounts for from the fituation of the anthers, which are, in a manner, perforated by the ftigma. *Vide* SYNGENESIA.

In the order *polygamia fruftranea*, of the fame clafs, the florets in the circumference *(radius)* which are female, or furnifhed with the piftillum only, are never impregnated, though there are hermaphrodite flowers in the center, (*difcus*); becaufe the ftigma is wanting. To this order belong the fun-flowers, centaury, *&c.*

In faxifrage, *faxifraga*; and feveral plants, where the piftillum is very fhort; the anthers approach and form a compact body immediately above the ftigma.

This approaching of the anthers, fays Linnæus, is very remarkable in the genus *celofia*, at the time of their burfting and difcharging the duft.

3. Among animals, the male and female organs of generation ripen, and are in a capacity of performing their functions much about the fame time.

In plants, the ftigma, which is the fuppofed female organ, is in its greateft vigour, when the male duft is difcharged by its organ the anther.

This coincidence in point of time is obferved, not only in hermaphrodite flowers, or fuch as have the anthers and ftigma contained within the fame covers; but likewife in the claffes *Monœcia* and *Diœcia* of Linnæus, where thofe organs are placed apart within different covers, on the fame root, as in the former, or on diftinct roots, as in the latter. In thefe claffes, the male flowers ripen their anthers, at the very time in which the female flowers ripen their ftigma. To ftrengthen the conclufion in favour of the fexes from the above-mentioned facts, let it be remarked, that in the plantain-tree, *mufa*, where the male flowers are pofterior to the

 female,

female, there is no impregnation, the pericarpium being barren, or devoid of ſeeds.

4. In the generality of flowers, the ſtigma withers and falls off, after the diſcharge of the pollen and fall of the anthers.

Such are the principal arguments for the ſexes, ariſing from a general view of the ſtructure, proportion, and ſituation of the ſuppoſed organs.

Experiments on theſe organs, give riſe to a ſecond ſet of arguments; the management and culture of fig and palm-trees, furniſh a third ſort. Theſe, along with the oppoſite ſet of arguments, employed by Dr. Alſton, and other eminent naturaliſts, ſhall be fully enumerated under the article SEXUS PLANTARUM, whither we refer our readers.

ANTHOPHILI, (from ἄνθος, a flower, and φιλέω, to love). Floriſts.

The varieties ariſing chiefly from the colours of the corolla, in the ſame ſpecies of plants, are the principal object of the floriſt. In many ſpecies of flowers, the colour is variable; as in the tulip, hyacinth, ranunculus, pink, blue bottle, violet, columbine, fumatory, *&c.* Such flowers, therefore, claim, in an eminent manner, the attention of the floriſt. *Vide* VARIETAS.

Double flowers, which are a ſpecies of monſters in the vegetable kingdom, and ariſe from a luxuriancy of nouriſhment, are likewiſe the delight of the floriſt. *Vide* PLENUS *Flos*, MULTIPLICATUS *Flos*, *&c. Phil. Bot.* p. 81, 240.

ANTHUS, (from ἄνθος, a flower); the flower. A term uſed by Columna, ſynonimous to the *corolla* of Linnæus.

We have ſeen that the petals, or coloured leaves, are not eſſential to the exiſtence of a flower, which, according to Linnæus, is conſtituted by the preſence of the anthers and ſtigma. *Vide* Principles of the Sexual Method, under the article ANTHERA.

The ſuppoſed utility of theſe organs in the buſineſs of generation ſuggeſted the definition. When that utility was not ſo much as dreamt of, we need not wonder, that the petals,

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the moſt conſpicuous and beautiful part of the plant, ſhould have claimed a principal regard, and even have been characteriſed by the name of *the flower*, by way of eminence; eſpecially as ſeveral Syſtems and Methods, particularly thoſe of Rivinus and Tournefort, are founded upon their figure, number, ſituation, and regularity.

APERTURA, (from *aperio*, to open); an aperture or opening; the minute opening in certain ſpecies of anthers ſo called. *Vide* ANTHERA.

APETALUS *Flos*, (from *a* priv. and *petalum*, a petal); having no petals, or corolla. The term was uſed by Tournefort, and adopted by Linnæus, and is equivalent to the *Imperfectus* of Rivinus, Knautius, and Pontedera; the *Stamineus* of Ray; the *Incompletus* of Vaillant, and the *Capillaceus* of other botaniſts. *Vide* COROLLA.

In almoſt every former ſyſtem, the preſence or abſence of ſuch a conſpicuous part as the petals, was a leading point: in the ſexual ſyſtem, however, the corolla is totally diſregarded in the primary diviſions, which are formed ſolely on the number, proportion, ſituation, union and abſence of the ſtamina, or ſuppoſed male organ of generation in plants. Hence we are not to expect in the *Genera Plantarum*, as in other botanical writings, a liſt, exhibiting at one view all the plants which are not furniſhed with petals: theſe are to be found diſperſed among the different claſſes in that accurate and elaborate work.

In general, few of the amentaceous flowers, and fewer of the claſs *Cryptogamia*, containing the moſſes, muſhrooms, ferns, and ſea-weed, are furniſhed with petals. *Vide* AMENTACEUS *Flos*, and CRYPTOGAMIA.

Many of the graſſes likewiſe, want the corolla.

Chriſtian Knaut, a Saxon, who was contemporary with Tournefort, and publiſhed a method founded upon the number and regularity of the petals, among other curious doctrines, denies the exiſtence of apetalous flowers.

APETALÆ, the name of a diviſion or claſs in moſt of the ſyſtematic botaniſts, conſiſting of ſuch herbs and trees as want the corolla. Apetalous herbs are generally ſubdivided

into apetalous properly ſo called, which want petals, but have the ſtamina: apetalous without flowers, which apparently want petals, ſtamina and calyx; as the ferns, which are dorſiferous, that is, bear their fruit on the back of the leaf: and apetalous without flower and fruit, as the moſſes and muſhrooms.

Apetalous trees contain, amongſt others, ſuch whoſe flowers have the ſpecies of calyx called *amentum*. *Vide* AMENTUM.

Theſe are the *amentacei* and *juliferi* of Tournefort, Hermannus, and others. *Vide* AMENTACEOUS *Flos*, &c. They form a conſiderable part of the claſſes *Monœcia* and *Diœcia*, of Linnæus. *Vide* MONOECIA, *&c.*

APEX, the top, or ſummit; a term uſed by Tournefort, Rivinus, and Ray, ſynonimous to the *anthera* of Linnæus. *Vide* ANTHERA.

APEX *Folii*, the tip or upper extremity of the leaf. *Vide* FOLIUM.

APHYLLÆ, (from α priv. and φύλλον, a leaf); devoid of leaves; the name of the firſt claſs in Sauvage's ingenious *Methodus Foliorum*, conſiſting of plants which are entirely deſtitute of leaves.

To this claſs belong muſhrooms, ſeveral of the ſea-weed, ruſh, garlick, &c.

APYRINÆ, (*apyrinus et apyrenus*, without ſtone or kernel, or a ſmall one, from the Greek ἀ, privativ. and πυρὴν, *nucleus*, a kernel), the name of the fifty-third claſs in Lud. Gerard's Arrangement of the Plants that are natives of Provence, in France. It conſiſts of two genera, the myrtle and pomegranate.

AQUATICÆ *Plantæ*, (from *aqua*, water); plants that grow in, or near water. Aquatics. The name of a claſs in Dodoneus's, Porta's, and J. Bauhin's Methods.

When artificial arrangement was yet in its infancy, ſyſtems were conſtructed, not as in modern times, from the ſtructure and ſituation of a particular part, but from a complex view of the whole plant. Neither was this view confined merely to the habit; it included every circumſtance,

however

however different; the place of growth, the time of flowering, the medicinal and œconomical uſes, the ſenſible qualities, and ſeveral other particulars, which by modern botaniſts, the only genuine ſyſtematical writers, are neceſſarily diſregarded as primary characters, but deſerve every conſideration as ſecondary marks of diſtinction and uſeful auxiliaries for obtaining a complete knowledge of the plant.

ARBOR, a tree; a perennial plant which riſes to a very great height, with a ſimple, woody, and durable ſtem, or trunk. By theſe characters, are trees, with great accuracy, diſtinguiſhed from herbs, whoſe ſtems are frequently compound, herbaceous, or ſucculent, and die down to the root every year.

All trees too are perennial, as is evident from the characters juſt enumerated: many herbs are either annual, that is, of one year's duration; or biennial, of two; thoſe only are perennial, whoſe roots, not periſhing with the ſtems, continue a long time under the ſurface of the ground, and put forth a new ſtem every year. *Vide* HERBA.

Upon theſe obvious and ſtriking differences was founded the very ancient diviſion of vegetables, into herbs and trees; though, perhaps, that diſtinction was principally ſuggeſted by the difference of ſize and duration of the plants in queſtion. Be that as it may, the diviſion was eſteemed ſo natural and ſpontaneous, that, from the time of Ariſtotle and Theophraſtus to the preſent age, it has obtained a principal place in almoſt every ſyſtem, thoſe of Rivinus and Linnæus excepted, which mix herbs and trees promiſcuouſly together.

Among the celebrated names in botany, which have retained the ancient diſtinction, are numbered Cæſalpinus, the father of ſyſtematic botany; Moriſon, Hermannus, Chriſtopher Knaut, Boerhaave, Ray, Pontedera, and Tournefort. The latter, rather than omit a diviſion, through cuſtom become neceſſary, choſe to hurt the elegance and uniformity of his plan; and, in fact, ſpun out into twenty-two claſſes, what, without ſuch a diviſion, might have been eaſily compriſed in ſeventeen.

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On the oppofite fide are ranged, befides Rivinus and Linnæus, already mentioned, Chriftian Knaut, Ludwig, and other names of lefs note.

The diftinction into trees and fhrubs, though of equal antiquity, is neither fo obvious, nor are its limits fo accurately afcertained. In fact, of the numerous characteriftic differences which have been fuggefted by botanical writers, not one is perfectly fatisfactory. To fay, with Tournefort, that trees are univerfally taller than fhrubs, is, in effect, faying nothing, unlefs a certain fixed, immutable ftandard were previoufly eftablifhed. Befides, every thing refpecting dimenfion is fo variable in its nature, and depends fo much upon difference of climate, foil and management, that were a ftandard of this kind attempted to be eftablifhed, the greateft confufion would enfue; and the fame plant in different countries, and even in oppofite foils in the fame country, would receive different appellations, according as it exceeded, or came fhort of the given ftandard.

Thus the *ricinus*, or palma-chrifti; the dwarf rofebay, *rhododendron*; the ftrawberry-tree, *arbutus*; and feveral others, which grow to the fize of very large trees in warm climates, are, in this country, equalled and even exceeded in height by many of our fmalleft fhrubs.

The difference of foil and culture in the fame climate, produces a like diverfity in dimenfion. Thus to take an example from herbaceous vegetables, the marigold, which, in a fat and moift earth rifes two feet high, fcarce exceeds the fame number of inches in a dry and gravelly foil.

Nature, fays Linnæus, has put no limits between trees and fhrubs. Where then are we to fearch for the foundation of this diftinction? Not in the difference of fize and height, for nothing can be more fallible. Either, he continues, there are no limits at all, or they are to be found in the buds; and the plants are ftiled trees, when their ftems come up with buds; fhrubs when they arife without buds: but this diftinction is fufficiently confuted by its author, who immediately fubjoins, that there are feldom any buds upon the very large trees in India; which muft, therefore, notwithftand-

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ing their great height, according to this definition, be reckoned ſhrubs.

The learned Dr. Alſton, in his *Tyrocinium Botanicum*, ſeems to conſider the diſtinction into trees and ſhrubs as a true natural diſtinction, and endeavours to trace its foundation in the internal ſtructure of the plants themſelves. All trees, ſays he, whether they bear buds or not, are covered with the two barks, the outer and inner, called by botaniſts, *cortex* and *liber*. Shrubs differ from herbaceous vegetables in the duration of their ſtems; from trees in the nature of their covering, which is not a bark, but a cuticle, or ſimple ſkin.

This thought is ingenious; but the fact on which it depends is not ſufficiently aſcertained.

The farther diſtinction into ſhrubs and under-ſhrubs, which is exceedingly arbitrary and indeterminate, was firſt ſuggeſted by Cluſius, in a work entitled, *Rariores & Exoticæ Plantæ*, publiſhed in 1576; and afterwards adopted by Cæſalpinus, and others. *Vide* FRUTICES.

ARBUSTIVA, (from *arbuſtum*, a copſe of ſhrubs, or trees; an orchard, or vineyard;) the thirty-ninth order of plants in the former editions of Linnæus's Fragments of a natural Method, containing theſe genera, the myrtle, mock-orange, *philadelphus*; *eugenia*, guayava, or bay-plumb, *pſidium*; and the clove-tree, *caryophyllus*. The firſt four belong to the claſs *Icoſandria* in the ſexual method; the laſt to the claſs *Polyandria*.

In the lateſt editions of theſe fragments, the above-mentioned genera form the nineteenth order, under the title of *Heſperideæ*. *Vide* HESPERIDEÆ.

ARILLUS, (from *arere*, to be dry or parched,) a term invented by Linnæus, and defined to be the proper exterior coat or covering of the ſeed, which, drying, falls off ſpontaneouſly.

All ſeeds are not furniſhed with an *arillus*; in many, a dry covering, or ſcarf-ſkin, ſupplies its place. In jeſſamine, hound's tongue, *cynogloſſum*; cucumber, fraxinella, *dictamnus*; ſtaff-tree, *celaſtrus*; ſpindle-tree, *euonymus*; African ſpiræa,

ſpiræa, *dioſma*; and the coffee-tree, *coffea*; it is very conſpicuous.

In the genus hound's tongue, four of theſe *arilli*, or proper coats, each infolding a ſingle ſeed, are affixed to the ſtyle, or pointal; and in this circumſtance, ſays Linnæus, does the eſſence of the genus conſiſt.

In fraxinella, the *arillus* is common to two ſeeds.

The ſtaff-tree has its ſeeds only half-involved with this cover.

The *Arillus* is either

Baccatus, ſucculent, and of the nature of a berry, as in the ſpindle tree, *euonymus*.

Cartilagineus, cartilaginous, or griſtly, as in the African ſpiræa, *dioſma*.

Coloratus, coloured, as in the ſtaff-tree.

Elaſticus, endued with elaſticity for diſperſing the ſeeds; as is remarkable in the African ſpiræa, *dioſma*; and fraxinella.

Scaber, rough, and knotty, as in hound's tongue.

Although covered with an *arillus*, or other dry coat, ſeeds are ſaid to be naked, (*ſemina nuda*,) when they are not incloſed in any ſpecies of *pericarpium*, or fruit-veſſel; as in the graſſes, and the *labiati*, or lipped flowers of Tournefort; which correſpond to the *Didynamia Gymnoſpermia* of Linnæus.

Seeds are ſaid to be covered, (*ſemina tecta*,) when they are contained in a fruit-veſſel, whether capſule, pod, or pulpy pericarpium of the apple, berry, or cherry kind. *Vide* SEMEN.

This exterior coat of the ſeed is, by ſome former writers, ſtyled *Calyptra*. *Vide* CALYPTRA. By Scopoli, the ingenious author of the *Flora Carniolica*, it is termed *Theca*, (a ſheath or caſe).

The different ſkins, or coverings of the ſeed, are adapted, ſay naturaliſts, for receiving the nutritive juices, and tranſmitting them within.

ARISTA, (derived, as the preceding term, from *areo*,

to be dried), the awn, ſharp beard, or point, iſſuing from the huſk, or ſcaly flower-cup, of the graſſes, called *Gluma*. *Vide* GLUMA.

The greateſt part of the plants that belong to the natural order of graſſes, are *hermaphrodite*, that is, bear flowers, which have the ſtamina and piſtillum within the ſame covers. *Vide* HERMAPHRODITUS *Flos*.

Some, however, are *androgynous*, that is, have both male and female flowers, produced on the ſame root; as the genera *zea*, *coix*, *olyra*, *tripſacum*, *zizania*. *Vide* MASCULUS *Flos*, and ANDROGYNA *Planta*.

Others are *polygamous*, that is, bear hermaphrodite flowers, and flowers of either, or of both ſexes, on the ſame, or on different roots: as the genera *andropogon*, *holcus*, Indian millet; *apluda*, *ægilops*. *Vide* POLYGAMIA.

The hermaphrodite graſſes are all reduced, except three, (vernal graſs, *anthoxanthum*; *cinna*, and rice, *oryza*;) under Linnæus's third claſs, *triandria*; the androgynous belong to the claſs *Monœcia*; and the polygamous to the claſs *Polygamia*. *Vide* MONŒCIA, POLYGAMIA.

Of hermaphrodite graſſes, ſome want the beard, as the genus *poa*.

A like deficiency is obſerved in the genera *zea*, *coix*, &c. which range under the head of androgynous graſſes.

Both male and female flowers of the genus *olyra*, have one of the valves only of the huſky calyx terminated with a beard.

The male flower of the genus *zizania*, wants the beard; the huſky corolla of the female, (*corolla gluma*,) at the termination of its large outward valve, or petal, is furniſhed with a very long one.

Of polygamous graſſes, *andropogon* and *holcus* want the *ariſta* in the calyx; the huſk of the corolla of the hermaphrodite flower, in the former, has a long, ſharp, and twiſted beard, proceeding from the baſe of the greater valve: in the latter, the outward valve is furniſhed with a very rigid beard of the ſame kind. The inner valve has none.

The valves of the huſky calyx of the hermaphrodite

 flower,

flower, in the genus *ægilops*, are furnished with various beards.

The outer valve of the husky corolla, in the same genus, is terminated with a double or triple beard. The inner valve has none.

Aristæ are either

Divaricatæ, scattered, or placed at a considerable distance from each other, opposed to *confertæ*, as in *bromus squarrosus*.

Dorsales, fixed to the back, or outward part of the husk, as in oat, and fox-tail grass, *alopecurus*.

Erectæ and *rectæ*, upright, perpendicular; as in *bromus*, and winged spike-grass, *stipa*.

Filiformes, thread-shaped, as the *aristæ* of a species of panic-grass, called by Linnæus, *panicum hirtellum*.

Glutinosæ, covered with a stiff glue; as in *panicum hirtellum*.

Geniculatæ, jointed; as in vernal grass, *anthoxanthum*.

Læves, smooth, or polished, without any roughness; as in *avena fatua*.

Lanatæ, woolly, covered with a soft substance like wool; as in *stipa pennata*, and *aristida plumosa*. In the last genus, there are three *aristæ*; the intermediate one only is woolly.

Longissimæ, very long; as in the winged spike-grass, *stipa*.

Patulæ, spreading; as in *aristida*, and *bromus scoparius*.

Pilosæ, hairy, covered with *pili*; as in *stipa tenacissima*, where the *aristæ* are hairy at the base.

Plumosæ, feathery; as in *geum*.

Recurvæ, bent back; as in *andropogon*, and *agrostis canina*.

Retortæ and *Reflexo-tortæ*, twisted backwards; this is exemplified in one of the *aristæ* of the genus *lagurus*.

Sanguineæ, of a blood colour; as in *panicum hirtellum*.

Setaceæ, bristly, covered with *setæ*, (*Vide* PUBES); as in the *agrostis canina*, and *hordeum jubatum*.

Terminales, fixed to the apex of the husk, as in *olyra*, and *lagurus*.

Tortiles, wreathed or twisted like a rope; as in *andropogon*, *stipa*, and *aira montana*. The beards of oats are twisted into a spiral form.

Villosæ,

Villosæ, hairy, almoſt ſynonimous with *piloſæ*; exemplified in *lagurus*.

Uncinatæ, hooked; as in *panicum hirtellum*, and *geum urbanum*.

Note, the ſeeds of herb-bennet, *geum*, are furniſhed with long jointed beards.

ARMA, arms; offenſive weapons. One of the ſeven kinds of *Fulcra*, or props of plants, enumerated by Linnæus in the *Delineatio Plantæ*, at the beginning of his Syſtem of Nature; and by Elmgren, a ſcholar of Linnæus, in his *Termini Botanici*, firſt publiſhed in the *Amænitates Academicæ*.

For the numerous variations theſe *fulcra* have undergone, ſee the article FULCRA.

In the lateſt editions of the *Philoſophia Botanica* that I have ſeen, no mention is made of *arma*, in enumerating the *fulcra*; in its ſtead are retained the antient FULCRA, *aculeus*, and *ſpina*, prickles and thorns; which, in the *Delineatio Plantæ* abovementioned, are regarded only as ſpecies: *arma* being the genus.

The different ſpecies of armour with which plants are furniſhed, are *aculei*, prickles; *ſpinæ*, thorns; *furcæ*, forks; and *ſtimuli*, ſtings. *Vide* ACULEUS, SPINA, *&c.*

They are intended, ſay Naturaliſts, to keep off animals from hurting the plants.

AROMATA, (Gr. ἀρώματα, all ſweet ſpices, herbs, ſeeds, and roots) the name of a diviſion in Ray's, Monti's, and Sceuchzerus's arrangement of the graſſes; conſiſting of ſuch as have an odoriferous quality.

AROMATICÆ *Plantæ*, odoriferous, of a ſtrong agreeable ſmell and taſte; aromatics; the name of a claſs in Dioſcorides, Cluſius, Hernandes, J. Bauhin, Johnſton, Rumfius, and ſeveral other botaniſts, who have arranged plants according to their virtues and ſenſible qualities.

The plants of the order *Didynamia Gymnoſpermia* of Linnæus, which correſpond to the *labiati*, or lipped flowers of Tournefort, are all aromatics.

ARTICULUS, that part of the *culmus*, or ſtalk in graſſes,

graffes, which is intercepted, or lies between two joints, or knots. *Vide* CULMUS.

ARUNDINACEÆ *Plantæ*, (from *arundo*, a reed); the twenty-feventh clafs in Ray's Method, confifting of trees, whofe feeds are *Monocotyledonous*; that is, furnifhed with a fingle *cotyledon*, or lobe. The *Palms* belong to this clafs. *Vide* COTYLEDONES.

ASCYROIDEÆ, (ASCYRUM, *Plin.* St. John's or St. Peter's wort), the name of the thirteenth clafs in Scopoli's *Flora Carniolica*, confifting of *Afcyrum*, *Hypericum*, and fuch genera as refemble them in habit and ftructure.

ASPERIFOLIÆ *Plantæ*, (from *afper*, rough; and *folium*, a leaf); rough leaved plants. The name of a clafs in Hermannus, Boerhaave, and Ray's Methods, confifting of plants which have four naked feeds, and whofe leaves are rough to the touch.

In Tournefort's fyftem thefe plants conftitute the third fection or order of the fecond clafs; and in Linnæus's Sexual Method, they make a part of the *Pentandria Monogynia*. *Vide* PENTANDRIA.

ASPERIFOLIÆ, the forty-firft order of plants in Linnæus's Fragments of a Natural Method.

Lift of Genera *contained in this Natural Order.*

SECTION I.

Rough-Leaved Plants, with four naked Seeds. Vide SEMEN.

Linnæan Genera.	*Englifh Names.*
Anchufa, —	— Buglofs.
Afperugo, —	— Small wild Buglofs, or Great Goofe Grafs.
Borago, —	— Borage.
Cynogloffum, —	— Hound's-Tongue, Venus's Navel-Wort, or Lawn.
Echium, —	— Viper's Buglofs.
Heliotropium, —	— Turnfole.
Lithofpermum,	— Gromwell, or Graymill.
Lycopfis.	
Myofotis, —	— Moufe-ear Scorpion-Grafs.

Onofma.

Linnæan Genera.	English Names.
Onosma.	
Pulmonaria, —	— Lungwort, or Sage of Jerusalem.
Symphytum, —	— Comfrey.

SECTION II.

Rough-Leaved Plants with two naked Seeds.

Cerinthe, —	— Honey-wort.

SECTION III.

Rough-Leaved Plants with five naked Seeds.

Nolana.

SECTION IV.

Rough-Leaved Plants with covered Seeds; Vide SEMEN. *or a Seed-Vessel, whether pulpy, or dry.*

1. *With a pulpy Seed-Vessel, with, or without a Stone;* (*Drupa,* or *Bacca.*)

α With a Stone, (*Drupa.*)

Cordia, —	— Sebesten.
Varronia.	

β Without a Stone, (*Bacca.*)

Tournefortia.

Ehretia.

2. *With a dry Seed-Vessel, or Capsule.*

Patagonula.

Habit and Structure of the Plants of this Order.

Most of the plants of this order are herbaceous and perennial.

The ROOTS are branched and fibrous.

The STEMS and branches rounded.

The BUDS of a conic form, naked, or without scales.

The LEAVES simple, alternate, commonly very rough to the touch, and in most of the herbaceous plants, sessile, that is, attached to the stem and branches without any foot-stalk. In the few trees, however, of this order, the leaves

have a foot-ſtalk, the lower part of which, after the fall of the leaves, remains on the branches like a ſpine or thorn.

Note, in the genus *Tourneſortia*, which is of the tree kind, the foot-ſtalk of the leaves is jointed.

In ſome ſpecies of *Tourneſortia*, *varronia*, and turnſole, *heliotropium*; the leaves are placed almoſt oppoſite; and in the ſmall wild bugloſs, *aſperugo*, there are three or four leaves diſperſed in whirls round the ſtem. The leaves at the bottom of borage are oppoſite: thoſe at the top, alternate.

The HAIRS, (*pili*,) are ſimple, and generally very rough to the touch.

The FLOWERS are in ſome genera ſolitary; but commonly collected into a *ſpike*, or *corymbus*, (*Vide* SPICA, CORYMBUS), and do not proceed from the angle formed by the ſtem or branch with the leaf, as in many plants, but from the ſide of the leaf, or from that part of the ſtem which is oppoſite to it.

In the genus *varronia*, the ſpike of flowers proceeds from the *axilla* or angle of the leaves.

The flowers are generally arranged on the ſide of the *ſpike*, or *corymbus*, and unaccompanied with any ſcale.

They are almoſt univerſally hermaphrodite; in a few ſpecies of ſebeſten, *cordia*, male and female flowers are produced upon different roots.

The CALYX, or flower-cup, is monophyllous, that is, compoſed of one leaf, which is divided from three to ten equal or unequal parts. Thoſe of the firſt ſection with four naked ſeeds, have the calyx deeply divided into five ſegments, which, as in the other genera of this order, are permanent, accompanying the germen to its maturity. Indeed, in the greateſt number of rough-leaved plants, the calyx ſerves as a *pericarpium* or ſeed-veſſel, and therefore could not be taken away, without injuring the tender ſeeds which are nouriſhed in its boſom.

The COROLLA, or coloured inner cover of the flower, is monopetallous, that is, compoſed of one petal, which, in different plants, is bell—funnel—ſalver—and wheel-ſhaped. The diviſions of the limb or upper part of the petal, are generally

generally five in number, alternate with thoſe of the calyx, equal, and regular, except in viper's bugloſs, *echium*; where the ſegments are unequal.

The Stamina are five in number, alternate with the diviſions of the corolla, and oppoſite to thoſe of the calyx. They are equal, attached to the tube of the corolla a little above its origin, and of the ſame height.

The Anthers or ſummits, are in ſome genera *connivent*; that is, approach and form a compact body above the filaments. This is particularly exemplified in borage, lungwort, *pulmonaria*; and the genus *tournefortia*.

The Pistillum, pointal, or female organ, is generally compoſed of a ſlender ſtyle, of the ſame length with the ſtamina, and crowned with a ſimple ſtigma. It proceeds from a germen, which in ſome plants is undivided, but generally ſplit into four. In hound's-tongue, the ſtyle is permanent.

In all the plants of the three firſt ſections, there is properly no ſeed-veſſel; the calyx, in theſe genera, ſupplies its place, and continues till the ſeeds are arrived at maturity.

In the plants of the fourth ſection, the ſeed-veſſel is either a *capſule*, as in *patagonula*; pulpy with a ſtone, (*drupa*,) as in ſebeſten, *cordia*; or pulpy without a ſtone, (*bacca*,) as in *tournefortia*.

The Seeds are generally four in number, and lodged in the bottom of the calyx.

In honey-wort, *cerinthe*, there are two ſeeds of a hard bony nature, each of which is furniſhed with two cells; and in the genus *nolana*, the number of ſeeds is five.

Sebeſten, and the genus *varronia*, have a ſtone or nut, which is divided into four cells.

The plants of this natural order are moſtly mucilaginous, with little taſte or ſmell.

Moſt of the rough-leaved plants, particularly thoſe of the firſt ſection, are uſed in medicine. The flowers are eſteemed cordial; the leaves and roots vulnerary and aſtringent; and the hard bony ſeeds, particularly thoſe of Gromwell, *lithoſpermum*, are reckoned powerful promoters of urine.

A decoction of the roots and leaves of comfrey, (*symphytum officinale*,) has been successfully applied in violent coughs, and disorders of the lungs and breast.

Externally, these plants are used for burnings, and poisonous bites; they extirpate warts, and relieve disorders in the loins.

AUTUMNALES *Plantæ*, (*autumnus*, autumn,) plants that flower in autumn. The third division in Du Pas's arrangement, from the time of flowering.

AXILLA, an arm-pit; the angle formed by the branch and stem, or by the leaf with either.

Leaves are said to be *axillary*, which proceed from the angle formed by the stem and branch. *Vide* FOLIUM.

B.

BACCA, a berry; defined by Linnæus to be a pulpy *pericarpium* or seed-vessel without a valve, inclosing several seeds which are naked, that is, have no other covering. The seeds are sometimes dispersed promiscuously through the pulp, as in the water-lily; but generally placed on receptacles or foot-stalks within the pulp, as in the currant, gooseberry, raspberry, *&c.*

In the lesser burdock, *xanthium*, the seed-vessel, which is called by Linnæus, though improperly, a berry, is dry, and contains within it a nut furnished with two cells.

The seed-vessel or fruit of the *capsicum*, which the same author also improperly styles a berry, has no pulp, and is hollow within.

From these and other instances which might be produced, we may safely affirm, either, that the definition of a berry just now given is imperfect, or that the seed-vessels of a great number of plants are, in the *Genera Plantarum*, wrongly denominated berries. To say truth, it is sometimes difficult to refer a pericarpium to the head of *bacca*, or *drupa*, as defined by Linnæus. The only difference betwixt these seed-vessels consists in the nature of the seeds inclosed within

within the pulp. In the latter is inclofed a nut, or ftone; in the former, a number of naked feeds. Thefe definitions being eftablifhed, to what head are we to refer the leffer burdock, which, as we have feen, contains a nut within a dry pericarpium? Why, certainly, to the head of *drupa*, as well as the walnut, and many other plants which have a dry feed-veffel inclofing a ftone, or nut. On the other hand, we may refer the walnut, and other dry pericarpiums, which inclofe a nut, with equal propriety, to the head of *bacca*, as the leffer burdock, the feed-veffel of which is denominated, by Linnæus, a berry.

The very different fruits, or, to fpeak more properly, feed-veffels of the fumach; night-fhade, *folanum*; fow-bread, *cyclamen*; medlar, *mefpilus*; orange, *citrus*; and pine-apple, *bromelia*; are all denominated berries.

The berry is commonly round, or oval, and frequently furnifhed, like the apple, and other fruits of that kind, with an *umbilicus* or fmall cavity, at the end oppofite to the foot ftalk.

A berry is faid to be *proper*, when it is formed of the pericarpium or feed-veffel; *improper*, or *fingular*, when it is formed of any of the other parts.

The latter fpecies of formation is frequent, and admits of numerous varieties.

The following are the moft confiderable.

In the mulberry, rofe, blite, and myrtle-leaved fumach, *coriaria*; a large, flefhy and fucculent calyx becomes a berry.

In the ftrawberry and cafhew nut, *anacardium*; a berry is formed of the common receptacle; in the rafpberry and adonis, of a feed; in marvel of Peru, *mirabilis*, of the *nectarium*; (*Vide* NECTARIUM) in garden-burnet, *poterium*, of the tube of the corolla, which hardens and fhuts for that purpofe; in fpindle-tree, *euonymus*, of a fucculent *arillus*, or proper feed-covering. *Vide* ARILLUS.

The berry does not naturally gape, or burft; the difperfion of the feeds within the pulp being defigned to be performed by means of animals. *Vide Philofophia Botanica*, p. 75. 87.

BACCIFERÆ *Herbæ*, (from *bacca*, a berry; and *fero*, to bear); herbs that have a berry for their *pericarpium* or feed-veffel.—The fixteenth clafs in Morrifon, feventeenth in Hermannus, firft in Chrift. Knaut, twenty-fifth in Boerhaave, and feventeenth in Ray's Method; confifting in fome fyftems of all fuch plants as have a pulpy fruit, whether of the apple, berry, or cherry kind; in others, with more propriety, of fuch only as have that fpecies of pulpy pericarpium, called *bacca*. *Vide* BACCA.

BARBA, a beard; a fpecies of *pubes* or down, with which the furface of fome plants is covered. *Vide* PUBES.

The term was invented by Linnæus, and made its appearance in the *Delineatio Plantæ*, without any explanation. Its meaning, therefore, has not been accurately afcertained: though, by its application in the *fpecies plantarum*, it feems to fignify a tuft or bunch of ftrong hairs terminating the leaves. *Mefembryanthemum barbatum*, furnifhes an example.

BARBA *Corollæ ringentis*, the lower-lip of a ringent, or gaping corolla. *Vide* COROLLA.

The term was invented by Rivinus, and ftands oppofed to *galea ringentis*, the upper-lip. *Vide* GALEA *corollæ ringentis*.

BARBATUS *Flos*, (from *barba*, a beard); a bearded, gaping, or ringent flower; a term ufed by Rivinus, fynonimous to the *ringens* of Linnæus, and the *labiatus* and *perfonatus* of Tournefort. *Vide* COROLLA, and LABIATUS *Flos*.

The ringent, or gaping flowers, form the *Didynamia* of the Sexual Method. *Vide* DIDYNAMIA.

BICORNES *Plantæ*, (from *bis*, twice, and *cornu*, a horn); plants whofe anthers have the appearance of two horns.

The name of the eighteenth order in Linnæus's Fragments of a Natural Method.

Lift of the Genera *contained in this Natural Order.*

SECTION I.

Plants with horned Anthers, *and four* Stamina.

Linnæan Genera.	*Englifh Names.*
Blaeria.	

SECTION II.

Plants with horned Anthers, *and five Stamina.*
(Pentandria *of* Linnæus.)

Linnæan Genera.		English Names.
Azalea.		
Myrſine,	— —	African Box.

SECTION III.

Plants with horned Anthers, *and eight Stamina.*
(Octandria *of* Linnæus.)

Erica,	— —	Heath.
Vaccinium,	— —	Whortle, or Bilberries.

SECTION IV.

Plants with horned Anthers, *and ten* Stamina.
(Decandria *of* Linnæus.)

Andromeda.		
Arbutus,	— —	Strawberry-tree.
Clethra.		
Epigæa,	— —	Trailing Arbutus.
Gaultheria.		
Kalmia,	— —	Dwarf-Laurel of America.
Ledum,	— —	Marſh Ciſtus, or wild Roſemary.
Pyrola,	— —	Winter-Green.
Rhododendrum,	—	Dwarf Roſe bay.
Rhodora.		
Royena,	— —	African Bladder-Nut.

SECTION V.

Plants with horned Anthers, *and twelve or more* Stamina.
(Dodecandria *of* Linnæus.)

Garcinia,	— —	Mangoſtan.
Haleſia.		
Styrax,	— —	Storax-Tree

SECTION VI.

Plants with horned Anthers, *and many sets of united* Stamina.
(Polyadelphia *of* Linnæus.)

Linnæan Genera.	*English Names.*
Citrus, — —	Citron, Orange, Lemon.

SECTION VII.

Plants with horned Anthers, *and Hermaphrodite Flowers, with Flowers of either or both Sexes, on distinct Roots.*
(Polygamia Diœcia *of* Linnæus.)

Diospyros, — —	Indian Date Plumb.

The appearance of horned *anthers*, which has given name to this order, is not very conspicuous, unless in the following genera: whortle-berries, heath, strawberry-tree, dwarf rose-bay, and trailing arbutus. The fifth and sixth sections seem to be improperly annexed to this order.

Habit and Structure of the Plants of this Natural Order.

The plants of this order are all of the shrub and tree kind.

The ROOTS are branched and fibrous.

The STEMS and branches cylindric.

The BUDS conic, sometimes covered with scales, as in the strawberry-tree; sometimes naked or without scales, as in storax.

The LEAVES are generally alternate; in heath, *rhododendron*, and some species of *kalmia*, they are opposite.

In most of the plants of this order, the leaves are either sessile, that is placed upon the branches without a foot-stalk, or supported by a very short foot-stalk, which is semi-cylindric, and flat above. In a species of *rhododendron*, called *dauricum*, the leaves are furnished with long foot-stalks.

The FLOWERS in this order are universally hermaphrodite, except in one genus, Indian date plumb, *diospyros*; where hermaphrodite and male flowers are produced in the same species, upon distinct roots.

The flowers proceed either solitary, or in a *corymbus*, from the angles formed by the leaves and branches; or hang down

down in ſpikes and cluſters, at the end of the branches; each flower having a ſmall ſcale, or floral leaf, placed under it.

In moſt plants of this order, the calyx is placed around or below the germen. In the genera *vaccinium*, *ſtyrax*, *haleſia*, it is ſeated above the germen; a circumſtance which eſſentially diſtinguiſhes thoſe genera from all the plants of the family to which they belong.

The CALYX is univerſally a *perianthium*, and generally monophyllous or of one piece deeply divided into four or five ſegments, which are permanent, that is, accompany the germen to its maturity. The ſegments are often acute, and ſometimes coloured. In heath, *erica*; and mangoſtan, *garcinia*; the flower-cup is compoſed of four diſtinct leaves.

Trailing arbutus, *epigæa*; and the genus *gaultheria*; have the appearance of a double calyx: the external conſiſting of three leaves in the former, of two in the latter; the internal being divided into five ſegments in both.

Some ſpecies of heath, *erica*, have likewiſe a double calyx.

The inner calyx in the genus *gaultheria* becomes pulpy like a berry, and in this form ſurrounds the ſeed-veſſel, which is a *capſule*. *Vide* CAPSULA.

In the orange-tree, *citrus*, the calyx is *marceſcent*, that is, withers without falling off.

The COROLLA, or coloured inner cover, is generally monopetalous, and bell or funnel-ſhaped; the figure, however, is not very conſtant, even in plants of the ſame genus, as is remarkably the caſe in heath *erica*; and the genus *andromeda*; which, in this and other circumſtances, are ſo ſimilar, as ſcarce to be diſtinguiſhed but by the number of ſtamina.

The LIMB or upper part of the petal, is commonly divided into four or five ſegments, which are ſometimes rolled back, as in *vaccinium*; ſometimes bent inwards, as in *blaeria*.

The limb too is ſometimes ſlightly cut, as in the genus *gaultheria*; ſometimes divided almoſt to the bottom, as in trailing arbutus, *epigaea*; and the ſtorax-tree, *ſtyrax*.

The

The TUBE or lower part of the petal, is cylindric, and generally of the fame length with the calyx. In the dwarf laurel of America, *kalmia*, it is longer than the calyx. The tube in trailing arbutus, *epigaea*, is hairy within.

Dwarf laurel of America, *kalmia*; and the genus *gaultheria*, are furnifhed with a *nectarium* of ten pieces, which, in the former, is horn-fhaped, prominent, and furrounds the limb of the corolla; in the latter, is placed round the *germen* or feed-bud, within the ftamina. *Vide* NECTARIUM.

Marfh-ciftus, *rhodora*, *clethra*, winter-green, *pyrola*; orange-tree, *citrus*; and *garcinia*; are polypetalous; that is, have a corolla compofed of more pieces than one.

The number of STAMINA in this order is from four to twenty. Thefe are generally erect, and attached to the lower part of the tube of the corolla. In *blaeria*, American upright honey-fuckle, *azalea*; *gaultheria*, heath, *erica*; and Indian date plumb, *diofpyros*, which are monopetalous; the ftamina are inferted into the common receptacle.

Dwarf rofe-bay, *rhodora*, and *gaultheria*, have declining ftamina.

The ANTHERS or fummits are bifid or forked below, and being flightly attached to the filaments, are frequently inverted in fuch manner as to exhibit an appearance like two horns at top. This appearance, however, as we obferved above, is confpicuous in a few genera only.

In winter-green, *pyrola*; and heath, *erica*; the anthers are not inverted, being forked at top.

African bladder-nut, *royena*, according to Linnæus, has two anthers upon each filament: (*Vide* ANTHERA *Didyma*.) though I am apt to imagine he has miftaken the horns or forked fummits of this genus, for two diftinct anthers.

In whortle-berries, *vaccinium*, the back of the anthers is furnifhed with two fpreading *ariftæ* or beards.

The GERMEN, or feed-bud, in plants of this order, is generally roundifh, and feated above the receptacle. In *rhododendron*, and *blaeria*, it is cornered. *Vaccinium*, *halefia*, and *ftyrax*, have the germen below the receptacle.

The

The STYLE is single, thread-shaped, of the same length with the corolla, and in a few genera permanent.

African bladder-nut, *royena*, has two styles; the genus *garcinia* scarce any; in *blaeria*, the style is much longer than the corolla.

The STIGMA or top of the style, is obtuse, and frequently entire.

In heath, the stigma is four cornered, and divided in four.

Trailing arbutus, mangostan, and the genus *rhodora*, have likewise a divided stigma.

The SEED-VESSEL is either a *capsule* with five cells, as in *kalmia*; a roundish *berry* with divisions of the same kind, as in the strawberry-tree: or an oblong four-cornered *nut* with two cells, as in *halesia*.

The SEEDS are numerous, frequently hard, or bony, generally roundish, sometimes cornered.

The plants of this order are astringent; particularly heath, winter-green, whortle-berries, and uva ursi, (*arbutus*.)

The berries of the Indian date plumb, *arbutus*, and *vaccinium*, are acid and esculent.

From the storax-tree is drawn, by incision, a fragrant, resinous gum, which is much used in medicine, particularly for coughs, catarrhs, and internal ulcers.

The leaves of winter-green, (*pyrola*,) says Lemery, are used internally, either in infusion, or powder, for the hæmorrhoids, inflammations of the breast, and fluxes of the lower belly: externally in plaisters and ointment, for stopping blood, and drying up wounds.

The flowers of the Azalea tribe bear a striking resemblance to those of honey-suckle, whence the name of American upright honey-suckle, by which the Virginian species are distinguished. From the clamminess of the flowers of one of these species, hence termed *azalea viscosa*, and by Catesby, *Cistus Virginiana, flore et odore periclymeni*, it seems highly probable, that the plant possesses balsamic virtues, which, if particularly investigated, might render it of sovereign use in medicine.

From the dried peel of the fruit of the Japanese Citron, the

the *citrus trifoliata* of Linnæus, cut into ſmall pieces, is prepared, with the addition of ſome other ingredients, a celebrated medicine known in Japan by the name of Ki-ko-ke; by which name the fruit itſelf is known among the vulgar. It is a thorny ſhrub, the trunk of which, ſays Kempfer, by age and culture, acquires the thickneſs of a tree. The leaves grow by threes like thoſe of trefoil, upon the extremity of a common foot-ſtalk: and to the white flowers, which reſemble thoſe of medlar, ſucceeds a fruit, which in external beauty differs nothing from a middle-ſized orange, the internal ſtructure of which it likewiſe reſembles, except that the pulp, which is contained in a cavity having ſeven partitions, is glutinous, of an unpleaſant ſmell, and harſh diſagreeable taste. The ſeeds are exactly like thoſe of the orange, and have the ſame taſte with the pulp. See Kempferi Amœnit. Exoticæ. p. 801.

BICORNES, is likewiſe the name of the forty-fourth claſs or natural order, in Lud. Gerard's Arrangement of the Plants that are natives of Provence in France; conſiſting, like the ſame order in Linnæus, of plants whoſe anthers have the appearance of two horns. The genera deſcribed by Gerard are,—*vaccinium*, *erica*, *azalea*, *rhododendron*, *arbutus*, *ſtyrax*, *pyrola*, and *hedera*, (ivy.) The laſt mentioned genus, though its anthers are bifid at the baſe, does not belong to Linnæus's claſs *Bicornes*; but is placed with the vine, and ſome other genera of plants, in the order *hederaceæ*. *Vide* HEDERACEÆ.

BIFERÆ *Plantæ*, (from *bis*, twice, and *fero*, to bear); plants that flower twice a year, in ſpring and autumn, as is common between the tropics. *Vide Phil. Bot.* p. 277.

BIFORA *Pericarpia*, (from *bis*, twice; and *fores*, a door); the name of a claſs in Camellus's Method, conſiſting of plants whoſe *pericarpium* or ſeed-veſſel, is furniſhed with two incloſures, termed *valvules*. *Vide* VALVULA.

It is exemplified in celandine, *chelidonium*.

BILOCULARES, (from *bis*, twice, and *loculus*, a little cell); the name of the thirtieth class or family, in Lud. Gerard's Arrangement of the Plants that are natives of Provence

vence in France; consisting of these genera; jessamine, *jasminum*; privet, *ligustrum*; the olive, *olea*; speedwell, *veronica*; mock-privet, *phillyrea*; and the ash-tree, *fraxinus*.

The title of this order would seem to import, that the several genera in question were furnished with a seed-vessel divided into two *loculi* or cells; yet, in fact, there are but two genera, jessamine, and speedwell, that answer this description; the rest having either a seed-vessel furnished with one cell only, as the olive, privet, and mock-privet; or no seed-vessel at all, except the crust or tough covering of the seed, as the ash-tree. The plants of this natural family make part of the order *Sepiariæ* of Linnæus; and, except the ash-tree, are all reduced to the class *Diandria*, in the Sexual System. *Vide* SEPIARIÆ, and DIANDRIA.

BIVASCULARES *Herbæ*, (from *bis*, twice, and *vasculum*, a little vessel); the name of the 9th class in Hermannus's Method, consisting of herbaceous vegetables, which have a single *capsule*, (*Vide* CAPSULA,) or hollow seed-vessel, divided into two *loculi* or cells. *Vide* LOCULAMENTA.

To this class belong thorn apple, *datura*; mullein, *verbascum*; the tobacco plant, *nicotiana*; water-purslane, *peplis*; *limeum*, *roella*, *galenia*, *weinmannia*, *cunonia*, *hydrangea*, *heliocarpus*, *curatella*, and many others.

Note, the term *bivascularis* is synonimous to *bilocularis*, in Linnæus.

BRACHIUM, and BRACHIALIS *Mensura*, the arm; a term of measure. *Vide* MENSURA.

BRACTEA, (properly a thin leaf or plate of gold, silver, or other metal,) a floral leaf; the name of one of the seven *fulcra* or *props* of plants, enumerated by Linnæus, in his *Delineatio Plantæ*, and *Philosophia Botanica*.

The invention of this term, though claimed by Linnæus, is due to Jungius, who uses it for the *corolla* of modern botanists, including under that name both petals and *nectarium*. *Vide* COROLLA, PETALUM, and NECTARIUM.

In fact, of the numerous terms with which the great reformer of botanical language pretends to have enriched the science, there

there are very few that have not been ufed, either in the fame, or a different fenfe, by former writers. Thus, *fpatha* is as old as Theophraftus; *germen*, which Linnæus applies to the feed-bud, is ufed by Pliny for the buds of the leaves: *involucrum*, is a term of Artedi; *legumen*, *cyma*, and *glandula*, are of great antiquity: *drupa* is to be found in Kyber's Lexicon, publifhed at Strafbourg, in 8vo. 1553. The terms *arillus*, and *bractea*, are very improper: nor can much be faid in favour of *fcapus* and *pedunculus*. In fhort, of the fixteen terms enumerated by Linnæus, as new and neceffary, there are but five in reality fuch; viz. *corolla*, *anthera*, *pollen*, *ftigma*, and *ftipula*. But this by the way.

The BRACTEÆ, or floral leaves, differ in fize, fhape, and colour, from the other leaves of the plant. They are fituated on the flower-ftalks, and often fo near the fructification, as to be confounded with the calyx. Examples of the floral-leaf may be feen in the lime-tree, *tilia*; cow-wheat, *melampyrum*; fage, lavender, *bartfia*, fome fpecies of fumatory, *muffaenda*, *hebenftretia*, *monarda*, hellebore, fennel-flower, *nigella*; paffion-flower, *paffiflora*; wild Syrian rue, *peganum*; bird's-foot, *ornithopus*; fome fpecies of French honey-fuckle, *hedyfarum*; African-broom, *afpalathus*; milk-wort, *polygala*; reft-harrow, *ononis*; lady's-finger, *anthyllis*; kidney-bean, *phafeolus*; bafe tree-trefoil, *cytifus*; Carolina kidney-bean tree, *glycine*; bird's-foot trefoil, *lotus*; indigo, dragon's-head, *dracocephalum*; and many others.

The floral-leaf is commonly of the fame duration with the ordinary leaves of the plant; a circumftance by which, in doubtful cafes, it will be diftinguifhed, with great accuracy, from the calyx or flower-cup, which always withers when the fruit is ripe, if not before.

Without attending to this obfervation, we might be apt to commit miftakes, in afcertaining feveral genera of plants; as hellebore, fennel-flower, paffion-flower, and others, which have *bracteæ*, but want the calyx.

In point of SIZE and HEIGHT, floral leaves are fhorter than the flower-cup in fnap-tree, *jufticia hyffopifolia*, and

ruellia

ruellia ringens: longer than the flower-cup in common clary, *ſalvia ſclarea*; *ruellia repens*, and *ſtipa ſpinifex*: larger than the flower-cup, and placed under it, in *royena villoſa*: ſhorter than the flower in ſpotted clary with a ſage leaf, *ſalvia ſylveſtris*; *fumaria nobilis*, and *minuartia campeſtris*: of equal length with the flower, in greater bulbous fumatory with a hollow root, *fumaria bulboſa*; *hypoxis erecta*, and *ornithogalum comoſum*: and longer than the flower in ſweet alpine currant, *ribes alpina*; and *minuartia montana*. *Cunila pulegioides*, beſides a number of ſmaller ones, has two floral leaves larger than the flower, placed on each ſide of the foot-ſtalk.

In reſpect to NUMBER, plants have either one floral leaf: as viſcous field gum ſuccory with ruſhy ſtalks, *chondrilla juncea*; *ariſtolochia piſtolochia*, and *andromeda dabœcia*: two, as *campanula alpina*, *commelina zanonia*, wild-briar, *roſa canina*; *royena villoſa*, *ruellia ringens*, *cineraria ſibirica*, and *hypoxis erecta*: three, as *erica calycina*, and diſtaff-thiſtle with a bellied netted involucrum, *atractylis cancellata*: four or five, as *corymbium ſcabrum*: or ſeveral, as *cunila pulegioides*, *ſtipa ſpinifex*, and many others.

The *bracteæ*, in black-berried upright honey-ſuckle, (*lonicera nigra*,) are compoſed of two dry ſcales, and three broad leſſer leaves.

In crown imperial, lavender, ſome ſpecies of ſage, *ſalvia*; and a few other plants, the flower-ſtem is terminated with a number of very large *bracteæ*, which, from their reſemblance to a buſh of hair, are denominated *coma*, and *bracteæ comoſæ*. *Vide* COMA.

Floral-leaves, particularly thoſe of the buſhy kind juſt mentioned, afford excellent marks of diſtinction in determining the ſpecies; on which account they merit the careful attention of every botaniſt.

BRACTEATÆ, (from *bractea*). The twenty-eighth claſs in Boerhaave's Method, conſiſting of herbaceous vegetables, which have petals, and whoſe ſeeds are furniſhed with a ſingle *cotyledon*, or lobe. *Vide* COTYLEDONES.

The term *bractea*, from which the name of this claſs is manifeſtly

manifestly derived, is used by Boerhaave, after Jungius, for the *corolla* of modern botanists. *Vide* BRACTEA.

This class stands opposed to the twenty-ninth class, *apetalæ monocotyledones*, of the same author, and is exemplified in the grasses.

BRUMALES *Plantæ*, (from *bruma*, winter); plants which flower in our winter; common about the Cape. *Vide Phil. Bot.* p. 276.

BULBOSÆ, (from *bulbus*); the name of the ninth class in Cæsalpinus's Systematic Method, consisting of herbaceous vegetables, which have a bulbous root, and a *pericarpium* or seed-vessel, divided into three cells. *Vide* BULBUS.

The tulip, onion, and lilly, furnish examples.

Bulbosæ, and *bulbosis affines*, are likewise the names of the twenty-fourth and twenty-fifth classes, in Ray's *Methodus Propria*, published in the *Philosophia Botanica*, p. 21.

BULBUS, (Gr. Βολβος, *Bulbus*, *radix quævis rotunda*,) a bulb; a kind of large bud, generally produced under the ground, upon or near the root of certain herbaceous plants, hence denominated bulbous.

A bulb is defined by Linnæus to be a species of *hybernaculum*, produced upon the descending *caudex* or root, consisting of *stipulæ*, *petioli*, the rudiments of the former leaves, and scales of the bark. *Vide* HYBERNACULUM, and CAUDEX.

The obscurity of this definition, and the great confusion in botanical terms thence arising, render it necessary for me to give a more accurate and precise idea of the term in question.

For this purpose, I would previously remark that every bud contains in miniature or embryo, a plant, in every respect similar to the parent plant upon which it is seated. Plants, therefore, are perpetuated in the buds, as well as in the seeds; and the species may be renewed, with equal efficacy, in either way.

The tender rudiments of the future vegetable, of which the bud is composed, are inclosed, and, during the severities of winter, defended from cold and other external injuries,

juries, by a hard bark, or rind, which generally consists of a number of scales, placed over each other like tiles, and fastened together, by means of a tenacious, resinous, and frequently odoriferous substance. Thus defended, the buds remain upon different parts of the mother-plant, till the ensuing spring; and are, therefore, with great propriety, denominated by Linnæus, the *hybernaculum*, or winter-quarters of the future vegetable.

With respect to their place, buds are seated either upon the stem and branches, or upon the roots: the former are stiled *gemmæ*, or buds properly so called; the latter bulbs, and suckers, *bulbi & turiones*; in French, *oignons & cayeux*. *Vide* GEMMA.

Annual plants, which perform the changes of vegetation but once, can have neither buds, nor bulbs; and are only preserved in the seeds.

Herbaceous perennials, which lose their stems during the winter, can have no *gemmæ*, or buds properly so called; but as they subsist several years by their roots, may be furnished with the other species of *hybernaculum*, called bulbs, which, according to the definition, are seated upon the descending *caudex* of the root.

Again, trees which are perennial, with a woody and durable stem or trunk, have generally *proper* buds, or *gemmæ*, but no bulbs.

In bulbous plants, as the tulip, onion, and lily, what we ignorantly call the root, is, in fact, a bulb, or *hybernaculum*, which encloses and secures the embryo, or future shoot.

At the lower part of this bulb, may be observed a fleshy knob, or tubercle, from which proceed a number of fibres, or threads. This knob, with the fibres attached to and hanging from it, is, properly speaking, the true root; the upper part being only the cradle, or nursery of the future stem, which after the bulb has repaired a certain number of times, it perishes; but not till it has produced, at its sides, a number of smaller bulbs, termed *turiones*, or *suckers*, for perpetuating the species.

One

One part of Linnæus's Definition ſtill remains obſcure. The bulb, ſays he, is compoſed of the remains or rudiments of the former leaves of the plant, *è rudimento foliorum præteritorum.*

It is eaſy to comprehend, that buds contain the rudiments of the future leaves; but how can bulbs be ſaid to contain the rudiments of leaves, which, to all appearance, are already periſhed?

To explain this, let it be obſerved, that, in the opinion of eminent botaniſts, the root, in a very great number of perennial herbs, is annually renewed, or repaired out of the trunk, or ſtalk itſelf; in which ſenſe only, roots are properly said to deſcend.

In the perennials alluded to, the baſis of the ſtalk continually, and by inſenſible degrees, deſcends below the ſurface of the earth, and is thus changed into a true root; which root, by the continuance of the ſaid motion of the ſtalk, alſo deſcends; and thus, according to the durableneſs of its ſubſtance, becomes a ſhorter, or longer root: the elder, or lower part rotting off in proportion as the upper is generated out of the ſtalk. Thus in brownwort, the baſis of the ſtalk, ſinking down by degrees, till it is hid under ground, becomes the upper part of the root; and continuing ſtill to ſink the next year, becomes the lower part, and the following year rots away.

This is exactly what obtains in bulbous roots, as well as in the far greater number of other herbaceous perennials: as arum, valerian, tanzy, brownwort, ſamphire, primroſe, wood ſorrel, iris, and others.

The immediate viſible cauſe of this deſcent, is the ſtring-roots, which this kind of trunks frequently puts forth; which deſcending themſelves directly into the ground, ſerve, like ſo many ropes, for pulling the trunk after them. Hence the tuberous roots of iris are ſometimes obſerved to re-aſcend a little, upon the rotting, or fading away of the ſtring-roots which hang at them.

In bulbous roots, where the ſtalk and former leaves of the plant are ſunk below, and formed into what is called the bulb,

bulb, or wintering of the future vegetable, the radicles, or ſmall fibres that hang from the bulb, are to be conſidered as the root, that is, the part which furniſhes nouriſhment to the plant: the ſeveral rinds and ſhells whereof chiefly the bulb conſiſts, ſucceſſively periſh, and ſhrink up into ſo many dry ſkins, betwixt which, and in their center, are formed other leaves and ſhells; and thus the bulb is perpetuated.

What has been ſaid of the deſcent of roots, by the ſinking of the ſtalk, is further confirmed by the appearance of certain roots; as of valerian, *plantago major*, and devil's bit, (*ſcabioſa ſucciſa*,) in which the lower part appears bitten, or chopped off. In theſe, the lower part rotting off, as the upper deſcends, the living remainder becomes ſtumped, or ſeems bitten.

All bulbous roots, ſays the learned Dr. Grew, in his Anatomy of Plants, may be conſidered as hermaphrodite roots, or root and trunk both together; for the radicles, or ſtrings only, are abſolute roots: the bulb actually containing thoſe parts which, ſpringing up, make the leaves, or body of the plant; ſo that it may be regarded as a great bud under ground.

We enlarged above, upon the deſcent of roots, by the ſinking of the ſtalk, or trunk; and gave evidences of the reality of ſuch an appearance. I ſhall only add to what was then obſerved, another demonſtration of the ſame appearance from the root of a ſpecies of *iris*, called by Grew, *iris tuberoſa*; in which, although the leaves fall off, cloſe to the ſurface of the ſtalk, yet after that is ſunk down, and ſwelled into a root, the ſeats of the periſhed leaves, and the ends of the veſſels belonging to them, become viſible: the whole ſurface of the root appears covered with ſeams and pricked lines; the former exhibiting the ſeats of the leaves; the latter, the terminations or broken ends of the veſſels; which ends are ſtill more apparent, upon ſtripping off the bark.

The deſcent, or ſinking of the ſtalk, may alſo be gathered from the ſimilar poſition and ſtructure of the veſſels, in the root and trunk of certain plants. In ſhort, as among animals, there are many which are not bred of eggs immediately, but

 transformed,

transformed, one into another, as in the case of many insects: so it is probable, that, among plants, there are not a few instances of the like transformation, whereof this is one.

From what has been said, we may clearly understand in what particular way some roots become perennial. Those of trees, shrubs, and divers other woody plants, are wholly perennial; others are only so in part, or by means of a new *progenies* of roots, proceeding from the old head, or body, in the room of those that die yearly, or after a certain time; as the roots of the potatoe, Jerusalem-artichoke, monks-hood, and others. In like manner, string-roots, or fibrous roots, succeed one another annually: so that, at the end of many years, what is still looked upon as the same individual root, is, in reality, another, as to every particle thereof.

Of bulbs, there are generally reckoned five species, or kinds.

Bulbus Squamatus, or Squamosus, a scaly bulb, consisting of thin plates, or scales, laid over one another like tiles, (*lamellæ imbricatæ*); as in the lilly.

Bulbus Articulatus, a jointed bulb, composed of several *lamellæ* or plates, that are closely linked together; as in *lathræa*, *adoxa*, and *martynia*.

Bulbus Duplicatus, consisting of two solid bulbs connected together; as in *fritillaria*, and some species of *orchis*. This kind of bulbous root is also called *testiculata*, from its fancied resemblance to a pair of testicles.

Bulbus Solidus, a solid bulb; composed of an entire fleshy substance; as in the tulip.

Bulbus Tunicatus, a coated bulb; consisting of several tunics or coats, closely embracing, or infolding each other; as in the onion, *cepa*. This species of bulb stands opposed to the former, which is of a solid substance, that is, has no divisions, or coats.

The coats in question are sometimes very thick, and so succulent, that they suffice to make the plant vegetate, without the assistance of earth and water. This is what happens in the officinal plant, *scilla maritima*, or sea-onion; the coated bulbs of which put out their stems, and produce flowers,

flowers, without being planted in earth, as they lie in the druggists shops. The vessels, with which these coats are probably furnished, absorb the humidity from the air, and thus perform the office of the small fibres of the root.

To the five species of bulbs, already enumerated, may be added a sixth sort,

BULBUS CAULINUS, a bulb seated upon the stem or stalk, in opposition to all the former species, which are placed immediately upon the root. Of these stem-bulbs, we shall speak more at large below.

It was observed in the definition, that bulbs are frequently produced near the root of certain plants. Such are the small bulbs, called suckers; the *soboles*, and *turiones*, of some writers; the *adnata*, and *adnascentia bulbi*, of others. These suckers, or off-sets, which frequently come up with surprizing rapidity, are produced from the sides of the old, or parent bulb, to which they are closely connected. Examples may be seen in the narcissus, amaryllis, sea-daffodil, *pancratium*, and several others.

Suckers serve instead of buds to bulbous plants; they renew the species, and, in some measure, replace the individual, by developing, or unfolding the plant which they contain in miniature.

This plant, although not visible by the naked eye, in the sucker, may be distinctly perceived, in the month of January, with the assistance of a good glass, in the center of the bulb.

Suckers begin to be formed on the bulbs, when the stalk and other adhering parts are supplied with little or no juice from the root; that is, when the plant begins to wither and fade. This, in our climate, happens in autumn; at which time, under-shrubs, and perennial herbs, collect on their roots new strength, for the vegetation of the ensuing year.

Thus we have seen, that suckers, as well as buds, contain the rudiments of a præ-existing plant; that their nourishment is transmitted by the parent-bulb, and that this nourishment developes and unfolds their parts, by assimilating to their substance the nutritive juices. Thus unfolded, the

the fucker produces an individual; forms news fuckers, which, in their turn, produce others; and in this manner multiply the fpecies, as certainly as the feed.

The terms *fcaly*, *jointed*, *folid*, and *coated*, are applicable to fuckers, as well as bulbs. *Vide fupra.*

Many plants form productions, which may be compared to *fuckers*, although they are not, like them, placed near the root. Such are the ftem-bulbs mentioned above, which, in different plants, are difpofed in different parts of the ftalk, or ftem.

In tooth-wort, *dentaria*; faxifrage; biftort; *diofcorea*; ftar of Bethlehem, *ornithogalum*; fiery-lily, *lilium humile*; and fome other liliaceous plants, the ftalks put out bulbs from the wings of the leaves; which, if taken off, when the ftalks decay, and planted, will quickly take root, and vegetate. Productions of the fame fort are obferved in moft of the *lichens*, with this difference, that in thefe they are feated without the wings of the leaves, *e axilla foliorum*. *Vide* AXILLA.

Such productions in imperfect plants of this kind, are not to be afcribed, fays a French writer, to any fpecies of generation; they are detached portions of their own proper fubftance, which, by a fimple extenfion, and without any regular developement, as in the cafe of germinating from a feed, or bud, become, as they enlarge, perfectly fimilar to the mother-plant.

In fome fpecies of garlick, hence denominated *bulbiferous*, bulbs are produced at the origin of the umbel of flowers, between the *pedunculi*, or foot-ftalks. *Vide* UMBELLA and PEDUNCULUS. Thefe fmall bulbs are fometimes among gardeners, known by the name of *cloves*.

An appearance of the fame kind is obferved in the flowers of two or three fpecies of *poa*, hence ftyled *viviparous*; and in the fruit of a plant of Senegal, called by M. Adanfon, *tangekolli*; the feeds of which germinate, and form bulbs or fuckers, *cayeux*, even before the capfule which contains them has arrived at maturity.

To the head of ftem-bulbs may be likewife referred the flefhy

fleſhy ſucculent leaves of ſeveral liliaceous plants; as the aloe, and ſea-onion, *ſcilla*; and of ſome ſpecies of *arum*; which being planted in the ground, take root, and vegetate.

Bulbs often afford a real ſpecific difference, and are ſometimes the ſole diſtinction; as in the ſea-onion, *ſcilla*; where the ſpecies are ſcarce to be diſtinguiſhed, but by the difference of the bulbs, which are either *coated*, *ſolid*, or *ſcaly*. *Vide ſupra*.

By their ſituation in the wings of the leaves, and on different parts of the ſtalk, ſtem-bulbs furniſh eſſential marks in ſtar of Bethlehem, tooth-wort, ſaxifrage, biſtort, lily, a few ſpecies of garlick, and ſome other plants.

In drying bulbous plants for uſe, it is neceſſary to ſtrip off the leaves, and expoſe the roots to a ſand heat.

C.

CADUCI, (from *cado*, to fall); the name of a claſs in Linnæus's *Methodus Calycina*, conſiſting of plants whoſe calyx is a ſimple *perianthium*, ſupporting a ſingle flower, or fructification, and falling off either before or with the petals. It ſtands oppoſed to the claſſes *perſiſtentes* in the ſame method, and is exemplified in muſtard, *ſinapi*; and ranunculus.

The term caducous in Botany, is expreſſive of the ſhorteſt period of duration, and has different acceptations, according to the different parts of the plant to which it is applied. A calyx is ſaid to be caducous, which drops at the firſt opening of the petals, or even before, as in poppy, *papaver*, and barren-wort, *epimedium*. Petals are caducous, which are ſcarce unfolded before they fall off, as in meadow-rue, (*thalictrum*); and ſuch leaves have obtained this denomination as fall before the end of ſummer.

From this definition of the term *caducus*, it evidently appears that the above-mentioned claſs in Linnæus's *Methodus Calycina*, includes not only ſuch plants as have a caducous

 calyx

calyx properly ſo called, but thoſe likewiſe in which the calyx is deciduous, that is, falls off either before or with the petals. *Vide* DECIDUUS *and* PERSISTENS.

CALAMARIÆ, (from *calamus*, a reed); the name of the third order in Linnæus's Fragments of a Natural Method. This order will be eaſily diſtinguiſhed from the family of the graſſes, to which it is nearly allied, by attending to the following particulars. *Vide* GRAMINA.

1. The baſe of the leaf, which embraces the ſtalk like a glove, has no longitudinal aperture in plants of this order, but is perfectly entire.

2. The ſtalk is generally triangular, and without knots, or joints.

3. The flowers have no petals.

Liſt of the Genera *contained in this Natural Order.*

SECTION I.

Hermaphrodite Plants.

Linnæan Genera.	English Names.
Cyperus, —	— Cypreſs Graſs.
Eriophorum, —	— Cotton Graſs.
Schœnus,	— Baſtard Cypreſs.
Scirpus, —	— Ruſh Graſs.

SECTION II.

Androgynous Plants. (Monoecia.)

Carex.	
Sparganium, —	— Burr-Reed.
Typha, —	— Cat's-Tail, or Reed-Mace.

In the former editions of the Fragments, the genera *Bobartia*, *Flagellaria*, and *Juncus*, made part of this order; they are now very improperly removed into the order *Tripetaloideæ*, which ſee.

Habit and Structure of the Plants of the Order Calamariæ.

In ſome plants of this natural order, the Roots are long and knotty; in others they are compoſed of fleſhy fibres, which pierce deep into the ground; and in others of a bulb.

The Stalks are three-cornered, ſtraight, and have no knots, or joints.

The Leaves are long, graſſy, frequently three-cornered, and have no *petiolus*, or foot-ſtalk, except the baſe of the leaf, which entirely embraces the ſtem, without any longitudinal aperture, as in the graſſes.

The membrane, and two lateral wings likewiſe, which crown the baſe of the leaf in moſt of the graſſes, are generally wanting in the plants of this natural order.

Exception. The genus *carex* is furniſhed with a ſhort membrane of this kind.

The Flowers are either hermaphrodite, as in the firſt ſection: or male and female upon the ſame root, as in the ſecond.

Note.—The female flowers, in ſome ſpecies of *carex*, are produced upon diſtinct roots from the male.

The mode of inloreſcence in this order, is generally a Spike; *Vide* Spica. ſometimes a Capitulum, or head, as in burr-reed. *Vide* Capitulum.

The Calyx, in plants of the firſt ſection, is a *gluma*, or ſcaly huſk; in thoſe of the ſecond, an *amentum*, or catkin. *Vide* Gluma, and Amentum.

The former ſpecies of calyx ſupports a ſingle flower in cypreſs-graſs, ruſh-graſs, and *eriophorum:* the latter in *carex.*

In baſtard-cypreſs; burr-reed, *ſparganium*; and cat's-tail, *typha*; the calyx is common to many flowers.

Some ſpecies of cypreſs-graſs, ſays a French writer, have two abortive, or imperfect flowers, at the bottom of each ſpike; the ſcales of which reſemble the common huſk or calyx, which is generally ſeated under the graſſes. By a ſimilar abortion, continues the ſame author, the genus *ſchœnus* appears to have a common calyx, conſiſting of ſeveral ſcales: whereas, in fact, of the ſix flowers which compoſe

each

each ſpike, the four loweſt proving abortive, leave void the ſpaces between their reſpective ſcales: ſo that the calyx of this plant has been erroneouſly ſuppoſed to conſiſt of ſix or more ſcales, formed into a common *gluma*, or huſk.

The COROLLA, in plants of this order, is wanting.

Exception. The female flowers of the genus *carex* are furniſhed with a *nectarium*, of an oblong figure, ſwelled out like a bladder, contracted above, gaping at the top, bifid, and permanent; the male flowers have neither petals nor *nectarium*.

The genus *ſchœnus*, according to Linnæus, has ſix lance-ſhaped, acute, and permanent petals.

The FILAMENTS of the STAMINA are three in number, ſhort, ſlender like a hair, and ſometimes briſtly.

Some ſpecies of cypreſs, and ruſh-graſs, have only two ſtamina; and Mr. Adanſon mentions a ſpecies of the latter, a native of Senegal, which never produces above one ſtamen.

The ANTHERS, or ſummits, are generally long, ſlender, and erect.

In cat's-tail, *typha*, the ſummits are oblong, and hang down, (*antheræ pendulæ.*)

The SEED-BUD is very ſmall, blunt, and ſometimes three-cornered, as in the *carex*, where it is placed within the *nectarium*.

The STYLE is thread-ſhaped, and of the length of the ſcaly calyx. In cypreſs-graſs, the ſtyle is very long: in *carex*, very ſhort.

The ſummits of the ſtyle, *ſtigmata*, are generally three in number, ſlender, hairy, and ſometimes permanent.

Note.—Cat's-tail has but one *ſtigma*; burr-reed, and ſome ſpecies of cypreſs-graſs, but two: in a ſpecies of ruſh-graſs, Sceuchzerus obſerved four.

Each flower, in plants of this order, is furniſhed with a ſingle *ſeed*, which is generally hairy, three cornered, and without any *pericarpium*, or veſſel.

Note.—In ſuch as have only a ſingle or double *ſtigma*, the ſeeds are not cornered, but oval, or flat.

The *nectarium*, in the genus *carex*, by cheriſhing the ſeed within

within its bofom, ferves inftead of a *pericarpium*, or fruit-veffel.

The virtues, ufes, and fenfible qualities of this order of plants, are the fame as thofe of the graffes to which it has been always joined by former botanical writers. *Vide* GRAMINA.

The roots of the round and long cyprefs-grafs, were formerly much ufed in medicine. The long is of our own growth, though not very common; the round we have from the Eaft-Indies. The former, which is properly the *cyperus* of the fhops, and is called by Tournefort, fweet-fcented *cyperus* with a long root, grows by rivulets, and other watery places, as ditches, and the like. The root is knotty, wrapped round with fibrous ftrings, not eafy to break, of a brown colour without, and grey within; of a pleafant fcent, efpecially when frefh, and well dried; the leaves are green, and refemble thofe of the reed and leek. The latter, fometimes called Englifh, or Flemifh cyprefs, grows in the water, and along banks and river fides. Its root is as thick as an olive, full of little knots, or fpecks, of an oblong figure, grey colour, fweet and fomewhat fharp tafte, and almoft without fmell, when it is newly taken out of the ground.

The roots of both plants are efteemed cordial, diuretick, and cephalick, refifters of poifons, and expellers of wind. Long cyprefs is much ufed by perfumers, and glovers.

Fragrant rufh, or camel's hay, which I take to be a fpecies of *fchœnus*, is a kind of reed, or grafs, which grows plentifully in Arabia Felix, and at the foot of Mount Libanus, where it ferves the people for forage and litter for their camels. The plant is about a foot high, with a fmall, hard, dry, knotty root, from which proceed feveral hard ftalks, of the fize, figure, and colour of a barley-ftraw. The leaves are about half a foot long, narrow, rough, pointed, and of a pale green colour. The flowers are fmall, hairy, of a carnation colour, agreeable to the eye, and of a warm, biting, aromatick tafte. All the plant, but efpecially the flower, is ufed in medicine. It is reckoned attenuating, deterfive, diuretic,

diuretic, and vulnerary: but its principal uſe, at preſent, is as an ingredient in the Venice treacle.

Long-rooted baſtard cypreſs, the *ſchœnus mariſcus* of Linnæus, ſerves, in Gothland and other parts of Sweden, for thatching, inſtead of ſtraw, and often grows in ſuch quantities in pools, as to form floating iſlands. *Vide* LINNÆI ITER GOTLANDICUM.

It is obſerved by Pennant, in his Tour to the Hebrides, that, in the Iſle of Sky, many-headed cotton-graſs (*eriophophorum polyſtachion*,) is uſed by the inhabitants to ſupport their cattle in the earlier part of the ſpring, before the other graſſes are ſufficiently grown. The poorer ſort, in Sweden, ſtuff their pillows with the down, cotton, or wool, which ſurrounds the ſeeds, and gives name to the genus; of which likewiſe they make wicks of candles: but for this purpoſe it is the leſs proper, as being apt to become brittle when dry.

The Laplanders, ſays Linnæus, in his *Flora Lapponica*, put the dried and carded leaves of the bladder-carex (*carex veſicaria*) into their ſhoes, to repel the cold in winter, and in the heats of ſummer, to prevent exceſſive perſpiration. In Italy and Germany, obſerves Micheli, in his *Nove Genera Plantarum*, the leaves of the ſame ſpecies of *carex* are uſed by different artificers, as glaſs-makers and ſadlers, for various purpoſes, but eſpecially by coopers, for ſtopping the chinks, and cloſing the joinings of their caſks.

With bull-ruſh *ſcirpus*, the *ſcirpus lacuſtris* of Linnæus, cottages are thatched, pack-ſaddles ſtuffed, and, in want of more ſubſtantial nouriſhment, cattle are ſometimes fed with it. *Lin. Flor. Suec.* p. 16. Mats, and bottoms of chairs too, are very commonly made of this ruſh. If cut at one year old, it makes the fine bottoms; coarſe bottoms are made of it at two years old; and thoſe that are ſtill older, mixed with the leaves of the yellow flag, (*Iris pſeud-acorus*), make the coarſeſt bottoms of all. *Withering*, vol. 1.

CALCAR *Corollæ*, the ſpur of the corolla. The *nectarium* ſo called, which terminates the corolla behind, like a

cock's

cock's-ſpur, in calve's-ſnout; valerian; orchis; violet; balſam, *impatiens*; lark-ſpur, *delphinium*; fumatory; butter-wort, *pinguicula*: and water-milfoil, *utricularia*. *Vide* NECTARIUM, and *Phil. Bot.* p. 73.

CALENDARIUM *Floræ*, a calendar; containing an exact regiſter of the reſpective times, in which the plants of any given province, or climate, germinate, expand, and ſhed their leaves and flowers, and ripen and diſperſe their ſeeds. *Vide Phil. Bot.* p. 276.

For particulars, on this curious ſubject, we refer the reader to the articles DEFOLIATIO, EFFLORESCENTIA, FRONDESCENTIA, FRUCTESCENTIA, and GERMINATIO.

CALIDÆ *Plantæ*, (from *calor*, heat); plants that are natives of warm climates. Such are thoſe of the Eaſt-Indies, South-America, Egypt, and the Canary iſlands.

Theſe plants, ſays Linnæus, will bear a degree of heat, which is as 40, on a ſcale, in which 0 is the freezing point, and 100 the heat of boiling-water. In the 10th degree of cold, they ceaſe to grow, loſe their leaves, become barren, are ſuffocated, and periſh. *Vide Phil. Bot.* p. 277.

CALOR, *heat*. In aſſimilating the vegetable with the animal kingdom, Linnæus terms heat the *heart* of Plants, *cor plantarum*. *Vide Phil. Bot.* p. 93.

"*Cor* plantis nullum, ſed calor efficit omne: nec opus eſt corde, ubi nec perpetui mobilis effectus neceſſarius eſt, & ubi propulſio, non circulatio humorum."

CALYCANTHEMÆ, (from calyx, the flower-cup; and ἄνθος, the flower); the name of the ſeventeenth order, in Linnæus's Fragments of a Natural Method, conſiſting of plants, which, among other characters, have the corolla and ſtamina inſerted into the calyx.

Liſt of Genera *contained in this Natural Order.*

SECTION I.

Plants having the Receptacle of the Flower, *placed upon the fruit.*

Linnæan Genera.	English Names.
Epilobium, — —	Willow-Herb, or French Willow.

Gaura,

Linnæan Genera.	English Names.
Gaura, —	— Virginian loofe-ftrife.
Ifnardia.	
Juffiæa.	
Ludvigia.	
Melaftoma, —	— American Goofeberry-tree.
Mentzelia.	
Oenothera, —	— Tree Primrofe.

SECTION II.

Plants having the fruit (Germen) *placed upon the* Receptacle of the Flower.

Ammannia.	
Frankenia.	
Glaux, —	— Sea-chickweed, or Milk-wort, and Black Salt-wort.
Griflea.	
Lythrum, —	— Willow-Herb, or Purple loofe ftrife.
Ofbeckia.	
Peplis, —	— Water Purflane.
Rhexia.	

Habit and Structure of the Plants of the Order Calycanthemæ.

This order furnifhes trees, fhrubs, and annual, biennial and perennial herbs. The herbaceous annuals are by much the moft numerous.

The ROOTS are branched and fibrous.

The STEMS and BRANCHES, cylindric.

In plants of the laft fection, the branches are generally oppofite; in thofe of the firft, alternate.

They are fquare, or four-cornered, when young, in both.

Note.—Such genera of the firft fection as have oppofite leaves, have likewife oppofite branches.

The BUDS are of a conic form, and without fcales.

The LEAVES, in plants of the firft fection, are generally alternate, fimple, and attached to the branches by a fhort foot-ftalk. In American goofeberry-tree, they are oppofite: and in French-willow, *epilobium*, oppofite and alternate upon the fame branch.

In all the plants of the laſt ſection, the leaves are oppoſite at the bottom of the ſtem; and in ſome, alternate towards the top. They are univerſally ſeſſile; that is, attached to the branches without any foot-ſtalk.

The MARGIN of the leaves in tree-primroſe, *ænothera*; ſea-milkwort, *glaux*; and French-willow, inſtead of indentments, has a number of ſmall grains, or white tubercles, which are not perceptible, without cloſe examination.

At the origin of the foot-ſtalk of the leaves, in *ludvigia*, *juſſiæa*, and ſome other genera of the firſt ſection, are diſcovered two ſmall ſcales in the form of *Stipulæ*, attached to the young branches.

The FLOWERS are univerſally hermaphrodite; growing oppoſite in ſuch as have the leaves oppoſite, from the wings of which they generally proceed.

In French willow, the flowers are attached to the foot-ſtalk of the leaves, as they are likewiſe in *turnera*, and a ſpecies of althæa frutex, *hibiſcus*; which do not belong to this natural family.—The modes of infloreſcence in this order of plants, are a *ſpike*, *corymbus*, and *racemus*. *Vide* SPICA, &c.

The CALYX is univerſally a *perianthium*, and generally monophyllous, that is, compoſed of one leaf.

In French-willow, it conſiſts of four diſtinct leaves; and in *mentzelia*, of five.

The ſegments, *laciniæ*, of the limb, or upper part of the calyx, are different in point of number and diviſion. In *oſbeckia*; tree-primroſe, *ænothera*; Virginian looſe-ſtrife, and *ludvigia*, it is deeply divided; in *rhexia*, *iſnardia*, and *griſlea*, more ſlightly cut, into four: in *frankenia*, and American gooſe-berry tree, it is marked with five indentments, or teeth; in *ammannia*, with eight; in water-purſlane, and purple looſe-ſtrife, with twelve.

The calyx, in plants of the firſt ſection, is placed upon the germen, or ſeed bud; the upper part falls off with the petals; the lower is permanent, and in fact, continuous with the *germen*.

In plants of the ſecond ſection, the calyx is permanent, and

and ſurrounds the ſeed-bud, without touching or being attached to it.

In *oſbeckia*, a ſmall fringed ſcale, *ſquamula ciliata*, is interjected betwixt each of the four lobes, or ſegments of the calyx.

Within the calyx, in the genus *gaura*, are lodged four oblong *glandulæ*, or ſecretory veſſels, which are cloſely attached to the tube. *Vide* GLANDULA.

Sea milk-wort, *glaux*, according to Linnæus, has no calyx.

The COROLLA, in this order, conſiſts of four, five, and ſix petals, which are attached to the tube of the calyx, and placed ſometimes alternate, ſometimes oppoſite to the diviſions of the limb.

The genus *iſnardia*, wants the corolla.

Glaux, according to Linnæus, has only one petal, which is bell-ſhaped, erect, and permanent.

Frankenia, and American gooſeberry-tree, are furniſhed with a *nectarium*, which, in the former, conſiſts of a furrowed and pointed claw, inſerted into the *unguis* of each of the petals: in the latter, of five ſcales placed under the filaments.

The STAMINA, which are, in number, from four to twenty, and upwards, are attached to the tube of the calyx, on its margin, as in the firſt ſection; or lower down, as in the ſecond. When the number of ſtamina is double the diviſions of the calyx, as happens in French willow, *gaura*, *juſſiæa*, and others; the ſtamina which ſtand oppoſite to thoſe diviſions, are a little longer than the reſt.

In the laſt ſection, the ſtamina, which are attached to the loweſt part of the tube of the calyx, are longer than the reſt, and ſtand alternate with the petals.

The ANTHERS, or ſummits, are generally of a hemi-ſpherical figure; frequently cleft, or ſlit below; and, by that aperture, attached ſlightly to the filaments, on which they often veer about, like a vane, or needle. They are furrowed longitudinally, and open on the ſides into two *loculi*, or cells.

The POLLEN, or male duſt, conſiſts of a number of minute particles, of an oval figure, yellow, and tranſparent.

The GERMEN, or ſeed-bud, in plants of the firſt ſection, is placed under the *receptacle of the flower*; in thoſe of the ſecond, above it.

The STYLE is ſingle, thread-ſhaped, and of the length of the ſtamina.

The STIGMA is generally ſingle, and undivided. In tree-primroſe, *epilobium*, *gaura*, and ſome others, it is divided in four.

The SEED-VESSEL, in this order, is a *capſule*, which is generally divided internally into four *loculi*, or cells. It opens commonly at top; and the apertures are equal in number to the cells. In *Melaſtoma*, the ſeed-veſſel is a berry.

The ſeeds are numerous, minute, and frequently three-cornered.

The plants of this natural order are reckoned aſtringent. Purple looſe ſtrife, and *epilobium*, have been uſed in medicine. The leaves of the hoary willow herb, *epilobium hirſutum*, being rubbed in the hand, emit a ſcent like ſcalded apples, from whence ſome have given it the name of codlins and cream.

The genus *ludvigia*, ſo called from Mr. Chriſt. Ludwig, of Leipſic, an eminent botaniſt, is very nearly allied to the tree-primroſe, from which it differs, however, in the number of ſtamina.

Purple willow-herb, *lythrum ſalicaria*, is deterſive, aſtringent, and vulnerary. It is efficacious in diarrhœas, and dyſenteries; and furniſhes a diſtilled water, which has been uſed with ſucceſs in inflammations of the eyes. The leaves and ſtem have a dry and aſtringent taſte.

The pulp of the fruit of an Eaſt Indian ſpecies of *Melaſtoma*, the Katou-Kadel of the *Hortus Malabaricus*, is uſed with ſucceſs by the inhabitants of Ceylon, in violent inflammations and excoriations of the tongue. It is from the colour of the pulp in the different ſpecies which ſtains the

 mouth

mouth of a deep black, that the generical name *Melastoma*, that is, black mouth, is derived.

CALYCIFLORÆ, (from *calyx*, the flower-cup, and *flos*, the flower); the sixteenth order in Linnæus's Fragments of a Natural Method, consisting of plants which, as the title imports, have the stamina (the flower) inserted into the calyx.

This order differs from the former, which has a title of the same import, in the following particulars.

1. The plants of this order want the corolla.

2. With respect to their sex, the flowers are either hermaphrodite and male upon the same root, *polygamia*; or male and female upon different roots.

3. The seed-vessel is pulpy, of the berry, or cherry-kind, and contains a single seed or stone.

The Order Calyciforæ *contains but four Genera:* viz.

Linnæan Genera.	English Names.
Elæagnus, —	— Oleaster, or Wild-olive.
Hippophae, —	— Bastard-Rhamnus, or Seed-Buckthorn.
Osyris, —	— Poet's-Casia.
Trophis.	

The last Genus is only to be found in the improved Editions of the Fragments.

Habit and Structure of the Plants of this Order.

All the plants of this order are of the shrub and tree kind. Some of them rise to the height of twelve or fourteen feet, as the wild olive; others to not above two or three, as poet's casia.

The ROOTS are branched, fibrous, and woody.

The STEMS are cylindric.

The BRANCHES, when young, are cornered.

The BUDS are of a conic form, and without scales.

The LEAVES are simple, alternate, and attached to the branches by a very short foot-stalk.

The

The FLOWERS are male and female upon diſtinct roots, in the three laſt genera; hermaphrodite and male upon the ſame root, in wild olive, *elæagnus*, where two male flowers are produced by the ſide of an hermaphrodite flower, at each wing, or angle of the leaves.

Note.—Linnæus, not attending to this circumſtance, places *elæagnus*, in the firſt order of his claſs *tetrandria*; which, according to his plan, ſhould conſiſt only of hermaphrodite flowers.

The CALYX, in this order, is a *perianthium*, which is compoſed of one leaf, divided into two ſegments, in ſea buck-thorn; into three in poet's caſia; and into four in wild olive. It is commonly placed upon the *germen*, which it accompanies to maturity.

Note.—The male plants of the genus *trophis*, have no calyx.

The COROLLA, in plants of this order, is univerſally wanting, except in *trophis*, the male plants of which, according to Linnæus, have four obtuſe and ſpreading petals.

The STAMINA are generally four in number, ſlender like a hair, ſhort, placed at a conſiderable diſtance from the ſtyle, and inſerted into the tube of the calyx.

Poet's caſia has only three ſtamina, which are oppoſite to the diviſions of the calyx.

The PISTILLUM is compoſed of a roundiſh *germen*, crowned with the calyx; a ſingle thread-ſhaped *ſtyle*; and a cylindric *ſtigma*, which, in poet's caſia, is deeply divided in three.

The SEED-VESSEL in the firſt genus, *elæagnus*, is an obtuſe, oval fruit, of the cherry kind (*drupa*,) with a puncture at the top, incloſing an oblong, obtuſe nut; in the three other genera, a globular berry, (*bacca*,) with one cell, containing a roundiſh ſeed.

In poet's caſia, the ſeed is hard like a ſtone, and fills the whole cavity of the *pericarpium*.

The plants of this order are aſtringent.

From the odoriferous flowers of the wild-olive is drawn an aromatick and cordial liquor, which has been ſucceſsfully uſed in putrid and peſtilential fevers.

Sea

Sea buck-thorn is purgative; poet's caſia, highly aſtringent.

The name *elæagnus* is derived from Ἐλαία, an olive, and Ἄγνος, *vitex*; becauſe the plant hath leaves like thoſe of the chaſte-tree, *vitex agnus caſtus*, and a fruit like an olive.

The yellow flowers of the oleaſter or wild olive of Boemia, *elæagnus anguſtifolia*, emit a ſtrong, agreeable ſcent, when fully expanded; from which circumſtance, ſays Mr. Duhamel, the Portugueze have given the name of *tree of Paradiſe* to this plant.

The genus *elæagnus*, is not to be confounded with the oleaſter or wild olive of Parkinſon, Gerard, and Ray. This laſt is only a particular ſpecies of olive, called by Tournefort and Caſpar Bauhin, *olea ſylveſtris*, and deſcribed to have a hard leaf, which is hoary on its under ſide. It grows naturally in woods, in the ſouth of France, Spain, and Italy, and is never cultivated.

The wild olive, *elæagnus*, is ſaid to poſſeſs the ſame virtues as the olive-tree. *Vide* SEPIARIÆ.

In *elæagnus latifolia*, which grows naturally in the iſland of Ceylon, and ſome other parts of India, the leaves continue green all the year.

The berries of baſtard rhamnus, or common ſallow-thorn, as it is ſometimes called, obſerves Linnæus, in his *Flora Suecica*, dye yellow. They are exceedingly acid, and by the fiſhermen of Aland, one of the Swediſh iſlands, prepared into an embamma, or ſauce, which gives to their fiſh a very agreeable ſavour. The ſhrub flowers in the early part of the ſpring, before it puts forth leaves, and in a ſandy ſituation, that is expoſed to the ſun, is uſed for hedges.

The berries of the genus *trophis* are eſculent.

CALYCIFLORÆ, is likewiſe the name of the eleventh claſs in Royen's Natural Method; and of the forty-eighth order in Lud. Gerard's Arrangement of the Plants that are natives of Provence, in France. In Royen's Method it is a very extenſive claſs, comprehending all plants which have the filaments of the *ſtamina* inſerted into the *perianthium*. It

exactly

exactly correſponds to the claſs *Floribundi*, in Linnæus's *Methodus Calycina*; and, beſides the claſs *Icoſandria*, in the ſexual method, includes the orders *Calycanthemæ*, and *Calyciſloræ*, which have been analyſed above. *Vide* FLORIBUNDI, and ICOSANDRIA.

In Lud. Gerard's Method, the order *calyciſloræ* is the ſame as in Linnæus.

CALYCINI, (from *calyx*, the flower-cup); the name of the ſixteenth claſs in Wachendorffius's Natural Method, conſiſting of plants with viſible flowers, which have a flower-cup, and whoſe ſeeds are furniſhed with a ſingle *cotyledon*, or lobe. *Vide* COTYLEDONES. It is exemplified in ruſh, *eriophorum*, and *cynomorium*.

CALYCISTÆ, (from *calyx*, the flower-cup). Syſtematic botaniſts ſo termed by Linnæus, who have arranged all vegetables from the different ſpecies, ſtructure, and other circumſtances of the calyx, or flower-cup.

The only ſyſtems of this kind are the *Character Plantarum novus*, a poſthumous work of Magnolius, profeſſor of botany at Montpelier, publiſhed in 1720; and Linnæus's *Methodus Calycina*, publiſhed in his claſſes *Plantarum*, at Leyden, in 1738.

By the *internal calyx*, in Magnolius's Method, is meant the *pericarpium*, or ſeed-veſſel.

CALYPTRA, (from καλυπτω, *tego*, to cover); a veil, or covering; one of the ſeven ſpecies of *calyx*, enumerated in the *Philoſophia Botanica*, and defined to be the proper calyx of the moſſes. It is placed over the *anthers* or ſummits, and in figure reſembles an extinguiſher, hood, or monk's cowl. *Vide* MUSCI.

The term was firſt uſed in this ſenſe, by Dillenius, to whom we owe the principal diſcoveries that have been made in the moſs, muſhroom, and *lichen* tribes.

The *Calyptra* is either

Acuminata, pointed, as in *minium*, and *bryum*.

Caduca, falling off early, and before the burſting of the anthers, as in *buxbaumia*.

Conica, of a conic form, as in moſt moſſes.

Glabra, ſmooth and ſhining, as in *hypnum*.

Lævis, poliſhed, without any inequalities, as in *ſplachnum*.

Oblonga, of an oblong figure, as in *minium*.

Villoſa, hairy, or ſhaggy, as in golden maiden-hair, *polytrichum*.

In ſome genera, as *lycopodium*, *porella*, *ſphagnum*, and *phaſcum*, the *calyptra* is wanting.

CALYPTRA, by Tournefort, and former botaniſts, was uſed to ſignify the proper exterior covering or coat of the ſeed, which falls off ſpontaneouſly. *Vide* ARILLUS.

CALYPTRATI, (from *calyptra*) the name of one of the principal diviſions in Dillenius's Arrangement of the Moſſes; containing ſuch of thoſe imperfect plants as are furniſhed with the ſmall membranaceous calyx called *calyptra*. *Vide* CALYPTRA.

This claſs, which is exemplified in water-moſs, *fontinalis*; and golden maiden-hair, *polytrichum*; ſtands oppoſed to the claſs or diviſion *Calyptra Deſtituti*, moſſes wanting the *calyptra*, of the ſame author. *Vide* MUSCI.

CALYX, (Gr. Καλυξ, a Καλυπτω, *tego*—*calyx*, *roſa clauſa*, *theca*, *vel cui aliquid includitur ut folliculus*, *putamen*, &c.—properly the bottom of a roſe-bud not fully blown). The outer covering of the flower, commonly called the flower-cup, which, in the greater number of plants, incloſes and ſupports the bottom of the *corolla*. *Vide* COROLLA.

It is defined by Linnæus to be the termination of the *cortical epidermis*, or outer bark of the plant, which, after accompanying the trunk, or ſtem, through all its branches, breaks out with the flower, and is preſent in the fructification, in this new form.

I am not, at preſent, to enquire into the propriety of a definition, which, by the way, contains neither the deſcription nor uſe of the part in queſtion: but only mean to oppoſe to the opinion contained in it, that of a very learned naturaliſt of the laſt century, Dr. Nehemiah Grew, who,

in

in his Anatomy of Plants, a moſt ingenious and elaborate work, thus expreſſes himſelf, with regard to the origin of the flower-cup. "The impalement, (*calyx*), whether of one or more pieces, I call that which is the outmoſt part of the flower, encompaſſing the other two; *viz.* the foliation, (*Corolla* of Linnæus) and the attire, (*Stamina* and *Piſtillum*). It is compounded of the three general parts, the ſkin, the cortical and lignous bodies; as is evident from the artichoke, in which the continuation of all theſe parts is clearly diſcoverable; the empalers being of that amplitude, as fairly to ſhew them all." *Grew's Anatomy of Plants*, p. 35.

By former botaniſts, the term *calyx* is always uſed in its proper and reſtricted ſenſe, as expreſſed above, and correſponds, therefore, to what, in the modern ſyſtems, is denominated *perianthium*.

By Linnæus, the reformer of botanical language, it is employed with much more latitude, as a generical term, comprehending the ſeven following ſpecies.

1. Perianthium, *Calyx* of Tournefort and others.
2. Involucrum.
3. Amentum, *Julus* of Tournefort.
4. Spatha.
5. Gluma, *Locuſta* of Ray.
6. Calyptra.
7. Volva.

Theſe different appellations of the calyx, for they are no other, depend upon circumſtances, which will be explained under each particular term. At preſent we may obſerve, that of the ſeven ſpecies above enumerated, the firſt, *perianthium*, is by much the moſt common; an *involucrum*, is almoſt peculiar to umbelliferous flowers; *gluma*, to the graſſes; *amentum*, to another order of plants; *calyptra*, to moſſes; and *volva*, to muſhrooms. When we ſpeak, therefore, of the proportion, figure, ſituation, or ſingularities of the *calyx*, we would always be underſtood to mean, that ſpecies of calyx called *perianthium*. The other ſpecies, which differ remarkably both in appearance and ſtructure from

from the firſt, are always denominated by their own proper names; that no confuſion, amidſt ſuch a diverſity of terms, may ariſe.

CALYX, then, being a general or generical term, and uſed, even when employed as a particular ſpecies, for the *perianthium*, it was thought proper to refer to that head the ſtructure, and ſingularities of this firſt part of the fructification. *Vide* PERIANTHIUM.

General Remarks.

1. Malpighi's, Ray's, Tournefort's, and Ludwig's Definition of the calyx, is applicable only to the *perianthium* of Linnæus.

2. The calyx is of a coarſer ſubſtance, and thicker than the corolla.

3. The leaves of the calyx are generally green; thoſe of the corolla coloured.

4. Notwithſtanding ſuch eſſential differences, nature ſeems to have put no abſolute limits between theſe parts of fructification; for in many plants, as *bartſia*, the calyx, or *perianthium*, is deeply coloured; and there are many flowers,—hellebore, and ſtar of Bethlehem, for inſtance,—which, having a coloured *corolla*, and no calyx, are ſubject to loſe their petals, about the time of flowering: but theſe afterwards hardening, turn green, and remain on the plant like a calyx.

In *daphnis*, the calyx and corolla are joined together, and united in the margin like a leaf of box. *Lin. Phil. Bot.* p. 58.

Burning thorny plant, or ſpurge, *euphorbia*, has been often erroneouſly deſcribed as monopetalous, by thoſe who have miſtaken the *calyx* for the *corolla*.

A more ſure mark of diſtinction betwixt the calyx and corolla, in doubtful caſes, is given under the article COROLLA, which ſee.

5. Both calyx and corolla are ſometimes ſtyled by Linnæus, the covers of the flower, *tegumenta floris*. Ludwig calls them by another name, of the ſame import, *involucra*.

6. In eſtabliſhing the analogy betwixt the animal and vegetable

vegetable kingdoms, Linnæus has diftinguifhed the calyx by the name of *thalamus floris*, or the conjugal bed.

7. The calyx, in the language of Tournefort, becomes the fruit, when the *receptacle* of the flower is placed upon the *germen*; which has, for its *receptacle*, the *extremity of the peduneulus* or foot-ftalk, to which it is attached. This defcription correfponds to the *germen inferum*, or *flos fuperus* of Linnæus, and is exemplified in campanula, madder, lady's bed ftraw, cucumber, marvel of Peru, valerian, and the umbelliferous flowers.

8. For a fure method of diftinguifhing the calyx from a *bractea*, or floral-leaf, with which it is frequently confounded, fee the article BRACTEA.

9. The following quotation, from Alfton's *Tyrocinium Botanicum*, publifhed at Edinburgh, in 1753, will give the reader a juft idea of the proportion that obtains in point of number, betwixt the feveral fpecies of calyx above enumerated. The *Genera Plantarum* at that time contained only 1021 genera. Of thefe, fays Dr. Alfton, 673 have a *perianthium* for their calyx; 72 a *fpatha*; 75 an *involucrum*; 29 a *gluma*; 18 an *amentum*; and 3 a *calyptra*. *Volva*, though defcribed in the *Phil. Bot.* to be the membranaceous calyx of the mufhrooms, yet, in fact, is never once mentioned in the *Genera Plantarum*, among the characters of the 11 genera of that kind of Imperfect plants there enumerated. About 110, he continues, want the calyx altogether; 25 have both a *perianthium* and *involucrum*; and a few plants have both a *perianthium* and *fpatha*. Befides, in *eriophorum*, *xyris*, cyprefs-grafs, *cyperus*: and rufh-grafs, *fcirpus*; the *fpike* is a calyx: in *morinda*, and fea-holly, *eryngium*; the *common receptacle*.

10. The defign of the empalement, (*calyx*) fays Grew, is to inclofe, fecure, and fupport the other parts of the flower; to be their fecurity before its opening, by intercepting all extremities of weather; and afterwards to be their fupport, by containing all the parts in their due, and moft graceful pofture.

Hence, continues the fame author, we have the reafon, why the calyx is frequently various, and fometimes wanting.

Some

Some flowers have none, as tulips; becaufe, having a fat and firm leaf, (*petalum*;) and each leaf, likewife ftanding on a broad and ftrong bafis, they are thus fufficient to themfelves. Carnations, (*dianthus*,) on the contrary, have not only an empalement, but that, for greater fupport, of one piece: for, otherwife, the foot of each leaf, or petal, being very long and flender, moft of them would be apt to break out of compafs. In the fame flower, the top of the empalement is indented; that the indentments may protect the petals, by being lapped over them before their expanfion, and afterwards may fupport and prop them up, by being fpread under them.

CAMPANACEÆ, (from *campana*, a bell); bell-fhaped flowers. The name of the twenty-ninth order, in Linnæus's Fragments of a Natural Method.

Lift of the Genera *contained in this Natural Order.*

SECTION I.

Bell-fhaped Flowers, with diftinct Anthers or Summits.

Linnæan Genera.	English Names.
Campanula, —	— Bell-Flower.
Convolvulus, —	— Bindweed.
Evolvulus.	
Ipomoea, —	— Quamoclit, or Scarlet Convolvulus.
Phyteuma, —	— Rampions.
Polemonium, —	— Greek Valerian, or Jacob's Ladder.
Röëlla.	
Trachelium, —	— Blue umbelliferous Throatwort.

SECTION II.

Bell-fhaped Flowers, with Anthers united into a Cylinder. (Syngenefia.)

Jafione, —	— Rampions with fcabious heads, or fheep-fcabious.
Lobelia, —	— Cardinal Flower.

Viola,

Linnæan Genera.			English Names.
Viola,	—	—	Violet, or Heart's-eafe.

Habit and Structure of the Plants of this Natural Order.

The plants of this order are generally herbaceous, and perennial. Some of the bell-flowers and bindweeds are annual; and a few foreign fpecies of the latter have woody ftalks.

The ROOTS are either fpindle-fhaped, as in bell-flowers and rampions; or branched and fibrous, as in convolvulus.

The STEMS are round, and, in convolvulus, twifted, in a direction oppofite to the diurnal motion of the fun.

The BRANCHES are generally alternate.

The LEAVES are fimple, alternate, and commonly attached to the branches by a femi-cylindric foot-ftalk, which is furrowed above. The indentments are terminated by a fmall white tubercle or knob, which renders them confpicuous.

Note, in fome fpecies of *lobelia*, the leaves are oppofite.

The FLOWERS are hermaphrodite, and proceed either folitary from the wings of the leaves, or are collected into a fpike and head, at the end of the flower-ftalk. In fome fpecies of *campanula*, they grow out of the angle formed by the ftem and branch.

The CALYX, in this order, is univerfally a perianthium, fituated upon, or round the *germen*, and generally compofed of one leaf deeply divided into five fegments. In *cvolvulus*, and violet, it confifts of five diftinct leaves; the common calyx, in fheep-fcabious, *jafione*, is compofed of a like number.

The COROLLA, is monopetalous, and of the bell, funnel, or wheel fhape. Umbelliferous throat-wort, *jafione*, and the violet, have five diftinct petals, which, in the laft, are unequal.

The TUBE, in flowers of the bell and wheel fhape, is very fhort; in thofe of the funnel fhape very long. In Greek valerian, the tube is fhut with five valves, which are placed on its *apex*.

The LIMB, or upper part of the *corolla*, is deeply divided

into five ſegments, which ſpread, and are alternate with the diviſions of the calyx.

In ſome ſpecies of *campanula*, as Venus's looking-glaſs, the *corolla* is very ſmall; and in others, becomes almoſt inſenſible. In convolvulus, it is beautifully plaited.

The *Corolla* in this order, is generally permanent; that is, accompanies the ſeed-bud to its maturity.

Bell-flower, *roella*, and the violet, are furniſhed with a NECTARIUM, which, in the two former, conſiſts of five ſcales placed in the bottom of the petal; in the violet, of a ſubſtance, which, in figure, reſembles a horn, or cock's ſpur, and terminates the upper petal of the *corolla*. *Vide* CALCAR.

The STAMINA are five in number, attached to the baſe of the tube of the corolla, alternate with its diviſions, and oppoſite to thoſe of the calyx. In bell-flower, and *roella*, the ſtamina are inſerted into the nectarium; and in Greek-valerian, into the valves of the tube.

The FILAMENTS, or threads, are diſtinct, very large at their origin, and frequently approach, ſo as to form a ſort of vault, which covers the ſummit of the *germen*. They are ſlender and awl-ſhaped above.

The ANTHERS, or ſummits, are very long, oval, marked with four longitudinal furrows, and either diſtinct, as in the firſt ſection; or united in a cylinder, as in the ſecond.

The POLLEN, or male-duſt, is compoſed of very ſmall, ſpherical, white, ſhining, and tranſparent particles.

The GERMEN, or ſeed-bud, is roundiſh, and ſituated, either wholly, or in part, under the flower.

The STYLE is generally ſingle, and of the length of the *ſtamina*, or *corolla*.

Note, the genus *evolvulus* has four ſtyles.

The STIGMA, or top of the ſtyle, is commonly ſingle, but deeply divided, as in bell-flower, Greek valerian, and rampions, *phyteuma*. Convolvulus, and *roella*, have a double ſtigma.

The SEED VESSEL is a roundiſh capſule, generally divided into three cells, and furniſhed externally with the ſame number of valves.

Note.

Note. The capſule of the violet conſiſts of only one cell: that of *roella*, *jaſione*, and *lobelia*, of two.

The figure of the ſeed-veſſel in the genus *campanula*, is exceedingly diverſified. In nettle leaved bell-flower, *campanula trachelium*, it is hairy, rough with knots, and divided into three cells. In *campanula rapunculus*, ſmooth, and egg-ſhaped; in Canterbury bell-flower, *campanula Medium*, furniſhed with five cells, and the ſame number of valves; and in Venus's looking-glaſs, priſm-ſhaped, with three cells.

The SEEDS are ſmall, numerous, attached to a receptacle in the center of the fruit, generally rounded, and ſometimes cornered.

The plants of this order abound with a white milky juice, which, upon the ſtalk being cut, flows out in great quantities. *Vide* LACTESCENTIA.

The roots and leaves of *campanula rapunculus*, (rampion,) are preſcribed, in decoction, for diſorders of the wind-pipe. They are much cultivated in France for ſallads; as they were in this country ſome years ago, though now almoſt univerſally neglected.

A decoction of the roots of a ſpecies of American *lobelia*, which Moriſon deſcribes under the name of *rapunculus galeatus Virginianus, flore violaceo majore*, is ſaid to cure the moſt inveterate venereal diſorders, in the ſhort ſpace of ten, or fifteen days.

Beſides thoſe already mentioned, and many others, this natural order furniſhes the following excellent medicines; ſcammony, turbeth, and jalap.

SCAMMONY is the inſpiſſated juice of the roots of a ſpecies of bind-weed, called by Tournefort, *Convolvulus Syriacus*, and *Scammonia Syriaca*; by Linnæus and Miller, *Convolvulus Scammonia*, Syrian bind-weed, and Syrian ſcammony.

This plant, which grows naturally in Syria, and the Levant, bears green leaves, almoſt in the ſhape of an heart, or nearly approaching to thoſe of ivy. The flowers are white, and of a bell-figure. The branches extend them-

ſelves

felves on every fide, to the diftance of four or five feet: they are flender, and trail on the ground, if not properly fupported. The plant is hardy, and will thrive very well in the open air in England, provided it is placed in a dry foil.

To procure the drug in queftion, incifions are made into the roots of the plant, and fhells placed under the wounds, to receive the milky juice which flows out. This juice is then thickened by means of fire; and afterwards put up in cods, or lumps, for exportation.

The beft fcammony comes from Aleppo, and St. John d'Acre. It is light, grey, tender, brittle, refinous, grinds to a grey powder, of a bitter tafte, and faint, unpleafant fmell. That which is heavy, hard, and black, is to be rejected, and is, in fact, either the juice of the whole plant, or what has been burnt, and otherwife damaged in the operation of thickening.

This concreted juice, which, by the way, is frequently fophifticated, is reckoned one of the ftrongeft purgatives, and is therefore never given without a corrector. In weak habits, it is apt to occafion irritations, and even inflammations; and therefore ought never to be adminiftered when there is the leaft fufpicion of inflammation in any part of the *abdomen*. It is likewife a very uncertain purge, fometimes not operating at all; at other times caufing fatal fuper-purgations: and, what is very remarkable, it often does not operate at all the firft day, but brings on afterwards an infupportable purging, followed by that violent inclination, called by phyficians, *Tenefmus*.

Scammony admits of various preparations. Thefe are the moft common: 1. *Diagrydium*, or fcammony prepared, and corrected with the juice of quinces. This is a very proper ingredient in the *Pulvis Cornachini*, which has all the virtues of fcammony, without any of its bad effects. 2. Scammony fulphurated. 3. Scammony vitriolated. 4. Extract of Diagrydium. 5. Extract of Scammony. 6. Syrup of Scammony.

All the preparations of this juice, fays Pomet, in his

Hiftory

Hiſtory of Drugs, are prevalent againſt old contumacious diſeaſes; ſuch as gout, ſcurvy, dropſy, rheumatiſm, obſtructions, head-achs, apoplexies, and remains of the venereal diſeaſe.

Beſides the Aleppo ſcammony, there are two other ſorts, commonly ſold by the names of Smyrna and Indian ſcammony. The former is black, heavy, full of ſtones, ſhells and other extraneous matter; the latter grey, light, and brittle; and diſcovered, by minute examination, to be a compoſition of ſome very ſtrong purgative powders made up of roſin.

TURBITH is a ſpecies of bind-weed, called by Ray, *Convolvulus Indicus, Alatus, Maximus, foliis Hibiſco nonnihil ſimilibus, anguloſis*; and by Linnæus, and Miller, *Convolvulus Turpethum*, turbith of the ſhops; it is deſcribed to have angular heart-ſhaped leaves, a quadrangular membranaceous ſtalk, and foot-ſtalks which ſupport many flowers.

The plant grows naturally in Ceylon and Malabar, in the Eaſt Indies. It is perennial, having thick fleſhy roots, which ſpread far in the earth, and abound with a milky juice, that flows out when the roots are broken or wounded; and ſoon hardens into a gummy ſubſtance, when expoſed to the ſun and air. From the root ſhoot forth many twining branches, which twiſt about each other, or the neighbouring plants, like the common bind-weed; the leaves and flowers reſemble thoſe of the marſh-mallow. The roots of this plant, the only part uſed in medicine, are brought to us from India, by the name of turpethum, and turbith.

Turbith, ſay writers on the *Materia Medica*, is a pretty ſtrong cathartic; purging tough ſerous humours from the remote parts, and thereby affording eaſe in the dropſy, gout, and rheumatiſm. Being given alone, ſays Lemery, it is apt to cauſe loathing and vomiting; and is therefore corrected with ginger, cardamoms, and grains of paradiſe.

The root of the white thapſia is often unſkilfully adminiſtered by apothecaries and druggiſts, for the true turbith.

Both black and white thapſia are exceedingly violent in their operations; and the juice, or milk, in the latter parti-

cularly, is ſo ſharp, that being rubbed upon the face, it will carry off the ſkin along with it. For this reaſon, the roots ought to be placed among the violent medicines, the uſe of which is very dangerous.

JALAP, the root of which has long obtained a merited place in our Diſpenſatories, is generally ranked with the bind-weeds, and termed by Ray, in his Hiſtory of Plants, *Convolvulus Americanus Jalapium dictus.* It is deſcribed to have foot-ſtalks with ſingle flowers, a tuberous root, and variable leaves, ſome of them being heart-ſhaped, others angular, and ſome oblong and pointed. The plant, which will not thrive in England, unleſs preſerved in a warm ſtove, grows naturally in a territory of the Spaniſh Weſt-Indies, ſituated between La Vera Cruz and Mexico, called Xalapa, or Jalapa, (the X, and J conſonant being in Spaniſh of the ſame ſound, and interchangeable,) from whence the drug in queſtion derives its name. It has been found a matter of great difficulty, notwithſtanding every poſſible reſearch, to aſcertain the genus of the vegetable producing this excellent medicine; nor does the place which it now holds in the Sexual Syſtem meet with univerſal approbation. Caſpar Bauhin's title was, *Bryonia Mechoacana nigricans.* Father Plumier, an eminent French botaniſt of the 17th century, having aſſerted in his *Deſcription des Plantes de l'Amerique*, that Jalap was a ſpecies of Marvel of Peru, (*mirabilis*); Tournefort was induced, upon his authority, to conſtitute a genus from that plant, under the title of *jalapa.* Plumier's opinion, too, was at firſt adopted by Linnæus, who, both in his *Species Plantarum* and *Materia Medica*, has diſtinguiſhed the plant whoſe hiſtory we are tracing, by the name of *Mirabilis Jalappa.* In his 12th edition, however, of the *Syſtema Naturæ*, publiſhed at Stockholm in 1767, he renounces his former idea, transferring the plant in queſtion to the genus convolvulus by the name of *Convolvulus Jalapa*, on the teſtimony of Miller, author of the Gardener's Dictionary, who had received ſome roots from Dr. Houſton, in the Weſt-Indies, which, on due examination, were found to be the true officinal

jalap;

jalap; and, from the doctor's report, pertained to a plant which was manifeftly a fpecies of bind-weed. That the botanical characters, however, are not yet fo fufficiently afcertained as to give fatisfaction to all, we may collect from this circumftance, that, in the London Pharmacopœia, this medicine is diftinguifhed by no fcientific name. Dr. Lewis, after the Edinburgh Difpenfatory, terms it *Convolvulus Jalapa Linnæi.*

Dr. Houfton, whom I juft mentioned, had procured fome roots of the true jalap, which he planted in Jamaica, as well with a view of fixing the genus as of cultivating the plants in that ifland. During his ftay there, they throve very well; but foon after he left the country, as Miller informs us, the perfon to whofe care he committed them, fuffered the hogs to root them out and deftroy them, fo that, when fome time after, he returned thither, there were no remains of them left; nor, as far as I can learn, has the plant been introduced into any of the Britifh iflands fince that time.

Jalap has a large root, of an oval form, full of a milky juice: from it proceed many herbaceous triangular twining ftalks, rifing to eight or ten feet, and garnifhed with fmooth leaves, which ftand upon long foot-ftalks. The flowers are faid to be bell-fhaped, like thofe of the common great bind-weed.

The root of this plant is reckoned an excellent cathartic, particularly in expelling ferous and watery humours; but fhould be adminiftered with caution, according to the ftrength and age of the patient, becaufe it works very vigoroufly.

Diftillers, and brewers, make great ufe of jalap, for exciting a fermentation.

Sea bind-weed, called likewife *foldanella,* and *braffica marina,* has been prefcribed in dropfies, with great fuccefs. The plant grows naturally on the fea-beach, in many parts of England, but cannot be long preferved in gardens. It has many fmall, white, ftringy roots, which fpread wide, and fend out feveral weak, trailing, reddifh ftalks, which twine about the neighbouring plants like the common bind-

 weed.

weed. The leaves are almoſt round, ſmooth, ſhining like thoſe of the leſſer celandine, but thicker. The flowers are of a purple colour, bell-ſhaped, and ſucceeded by a fruit that is almost round, and membranous, and contains a cornered ſeed, black, or white. The whole plant has a bitter taſte, and is a little ſaltiſh.

The roots of Spaniſh potatoe, *convolvulus batatas*, are eſculent. They are annually imported from Spain and Portugal, where they are greatly cultivated for the table: but they are too tender to thrive well in the open air in England. The plants are propagated by the roots, in the ſame way as the common potatoe, but require much more room.

The leaves, flowers, ſeeds, and roots of purple violets, *viola odorata*, are uſed in medicine. The leaves are emollient, and laxative; the flowers anodyne; the ſeeds uſeful in obſtructions of the kidneys and the nephritic cholic; the roots purgative and emetic. From a repeated infuſion of the flowers in the pureſt rain-water, is prepared the ſyrup of violets, which is cordial, corrects every thing acrimonious, and looſens the belly.

The violet is one of the four cordial flowers.

Greek valerian, obtained the name of *polemonium*, according to Pliny, from πολεμεῖν, to wage war, on account of the conteſts which aroſe betwixt two princes, each claiming the honour of diſcovering it.

The plants in the genus *lobelia*, according to Linnæus, are poiſonous. *Vide Phil. Bot.* p. 283.

This deleterious quality is ſaid to be particularly obſervable in two species; *Lobelia Longifolia*, a native of Jamaica, and a Peruvian ſpecies, vulgarly known by the name of *Tupa*, which Father Feuilleé affirms to be ſo exceedingly noxious, that the ſmell of it excites strong and long continued vomiting.

Lobelia Dortmanna, the aquatic bell-flower of Blair, poſſeſſes a more than ordinary ſhare of that lacteſcence which we announced above to be a general attribute of the plants of this natural order; even the leaves which grow under water abounding with milk.

We

We learn from the *Flora Suecica*, that the bloſſoms of *Jaſione montana* are peculiarly acceptable to bees; and that a green paint is procured from the flowers of round-leaved campanula.

CAMPANACEÆ, is likewiſe the forty-ninth claſs in Lud. Gerard's Arrangement of the Plants that are natives of Provence, in France; conſiſting of theſe four genera,—*campanula*, *phyteuma*, *jaſione*, and *ſamolus*.

CAMPANIFORMES *Herbæ*, (from *campana*, a bell; and *forma*, a figure). The name of the firſt claſs in Tournefort's Method, conſiſting of herbs and under-ſhrubs which have a ſimple flower, with a monopetalous corolla in the ſhape of a bell, or baſon. *Vide* COROLLA.

This claſs, in Tournefort, is ſubdivided into ſeven ſections or orders, from the ſituation of the *germen*, and nature of the fruit.

Mandrake; deadly night-ſhade, *atropa*; lily of the valley, *convallaria*; butcher's-broom; honey-wort; gentian; water-leaf; ſoldanella; convolvulus; dodder, *cuſcuta*; burning thorny-plant, *euphorbia*; caſſava, *jatropha*; *glaux*; wood-ſorrel, *oxalis*; rhubarb, *rheum*; navel-wort, *cotyledon*; dog's-bane, *apocynum*; Virginian ſilk, *periploca*; ſwallow wort, *aſclepias*; mallow; marſh-mallow; baſtard-mallow; *lavatera*; Indian-mallow, *ſida*; althæa frutex, *hibiſcus*; cotton, *goſſypium*; bryony, *tamus*; ſingle-ſeeded cucumber, *ſicyos*; male balſam apple, *momordica*; cucumber; gourd; bell-flower; rampions; croſs-wort, *valantia*; madder; and ladies bed-ſtraw, *galium*; are the bell-ſhaped flowers of Tournefort.

CAMPANIFORMES, is likewiſe the name of the ſixth and twenty-third claſſes in Pontedera's Syſtem, conſiſting of herbs and trees with bell-ſhaped flowers.

CANDELARES, the name of an order in the early editions of Linnæus's Fragments of a Natural Method, conſiſting of theſe three genera: *rhizophora*, mangrove; (the candel or kandel of the *Hortus Malabaricus*); *nyſſa* and *mimuſops*. They are removed in the later editions into the order HOLERACEÆ, which ſee.

CANDOR, the whites; a diſeaſe incident to trees. See the article VARIETAS.

CAPILLARES *Herbæ*, (from *capillus*, hair); capillary, or hair-ſhaped plants. The name of a claſs in Moriſon, Ray, and Boerhaave, conſiſting of thoſe imperfect plants called ferns. It correſponds to the ſixteenth claſs in Tournefort's Syſtem, and to the firſt order *Filices*, of the claſs *Cryptogamia*, in the Sexual Method. *Vide* FILICES, and CRYPTOGAMIA.

CAPILLUS, a term of meaſure, or dimenſion. *Vide* MENSURA.

Note. Linnæus calls the calyx of the female flowers of cat's-tail, *typha*; CAPILLI PAPPOSI, downy hairs. *Vide* PAPPUS.

CAPITATUS *Flos*, (from *caput*, a head). A fructification, generally conſiſting of many flowers firmly connected on the ſummits of the foot-ſtalk, ſo as to form a knob, or head. It is exemplified in globe amaranth, *gomphrena*. *Vide* CAPITULUM.

CAPITATÆ, is the name of a claſs in Ray's Method, and of a diviſion, or ſection, in Linnæus's Arrangement of the compound flowers, which conſtitute the forty-ninth order, in his Fragments of a Natural Method. *Vide* COMPOSITÆ.

CAPITULUM, a little head. A mode of infloreſcence, in which many flowers are collected into a head, at the extremity or ſummits of the foot-ſtalk; as in globe amaranth, *gomphrena*.

A *Capitulum* is either

Dimidiatum, halved; reſembling half a head, hemiſpherical; as in *lippia hemiſphærica*.

Folioſum, leafy, intermixed with leaves.

Globoſum, round, of a globular form; as in globe amaranth, *gomphrena*.

Hiſpidum, briſtly; as in field baſil, *clinopodium vulgare*.

Nudum, naked, having no leaves, oppoſed to *folioſum*.

Ovatum, egg-ſhaped; as in *lippia ovata*.

Pedunculatum, furniſhed with pedicelli, or little foot-ſtalks; as in *teucrium capitatum*. *Vide* PEDICELLUS.

Pyramidatum, ſhaped like a pyramid; as in *lippia Americana*.

Seſſile,

Seſſile, having no peduncles or flower-ſtalks; as in *teucrium pumilum*.

Subrotundum, roundiſh; as in *ſelago fruticoſa*.

Note. The anthers of the moſſes are ſtiled by Linnæus, CAPITULA, heads, or tops. *Vide Phil. Bot.* p. 223.

CAPREOLUS, (diminutive from *caprea*, uſed by Varro for a branch that putteth forth tendrils,) a tendril. *Vide* CIRRUS.

CAPRIFICATIO, (from *caprificus*, a wild fig); the very ſingular husbandry or management of fig-trees.—Caprification.

Before I enter upon a particular diſcuſſion of this curious ſubject, which furniſhes one of the principal arguments for the doctrine of the ſexes of plants, I would previouſly remark, that the fruit of the fig-tree is not a *pericarpium* or ſeed-veſſel, as other fruits, but a *receptacle*, incloſing and ſupporting the flowers within it.

Theſe flowers, in the cultivated fig-tree, are *female* only; but of the wild figs, ſome have *male* flowers; others have both *male* and *female* flowers diſtinct, though lodged within the ſame receptacle.

This being premiſed, two queſtions naturally occur: 1, In what manner are the flowers of the cultivated fig-tree fecundated? 2, How happens it, that the fruit of our fig-trees ripen, if the flowers are of one ſex only, and have no aſſiſtance from the male? For it is not pretended that there are any male fig-trees in this country.

The difficulty of the firſt queſtion is not immediately perceived. In the iſlands of the Archipelago, and other countries, where the wild, or male figs, grow in the neighbourhood of the female, why may not the fecundation of the flowers of the latter, by the ſprinkling of the male-duſt, be performed with as great facility as that of the palm trees, and even of many plants in our own country, which bear flowers of different ſexes on diſtinct roots? I anſwer, becauſe in fig-trees there is no communication between the male and female flowers. They are incloſed within the fruit, which, as we obſerved above, is not a *pericar-*

 pium,

pium, but a *receptacle*. How then, the queſtion ſtill recurs, is that fecundation effected? In a manner ſo ſingular, that were not the facts properly authenticated, they would exceed belief. A very ſmall kind of gnat, of a black colour, no where to be ſeen but about theſe trees, makes a puncture into the figs, at the time of their flowering, and there depoſits, along with its eggs, the duſt, or fecundating vapour of the ſtamina of the male, or wild fig, in which it had been formerly incloſed. Theſe inſects, whoſe worms can only ſubſiſt in the kernels of the fig-ſeeds, probably foreſee, by a ſort of wonderful inſtinct, that, if the ſeeds are not fertilized, they can produce no kernels, and conſequently no nouriſhment to their worms. For this reaſon, immediately after their tranſformation, they iſſue out of the fig, which has in ſome meaſure given them birth, copulate, repair to other figs, which are then in flower, prick them, enter by the aperture they have made, ſprinkle the fertilizing duſt of the ſtamina, which remains attached to ſeveral parts of their body, upon the ſtigma, or ſummit of the germen; and making a puncture into the germen, or ſeed-bud itſelf, there depoſit their eggs, one in each *germen*. Here the little worm being hatched, is nouriſhed with the ſubſtance of the kernel, till having attained its full ſize, and totally conſumed its proper nouriſhment, it is transformed, firſt into a *nympha*, and afterwards into a winged gnat, which, with its teeth, opens a paſſage for itſelf through the cavity of the *germen*, iſſues out of the fig, and, like its mother, takes the neceſſary precautions to perpetuate the ſpecies in other figs.

Such is the ſingular huſbandry and culture of fig-trees, as practiſed in Malta, Italy, and the iſlands of the Archipelago; countries where the fig-trees ſuſceptible of caprification naturally grow.

The moſt ample and ſatisfactory accounts of this curious operation in gardening, are thoſe of Tournefort and Pontedera: the former in his Voyage to the Levant, and in a memoir delivered to the Academy of Sciences, at Paris, in 1705; the latter in his *Anthologia*, or Philoſophy of Flowers.

Tournefort's relation is, in ſubſtance, as follows.

Of

Of the thirty ſpecies, or varieties of the domeſtic fig, which are cultivated in France, Spain, and Italy, there are but two cultivated in the Archipelago.

The firſt ſpecies is called *ornos*, from the Greek ἐρινὸς, which anſwers to *caprificus* in Latin, and ſignifies a wild fig-tree. The ſecond is the domeſtic, or garden fig-tree.

The former bears ſucceſſively, in the ſame year, three ſorts of fruit, called *fornites*, *cratitires*, and *orni*, which, though not good to eat, are found abſolutely neceſſary towards ripening thoſe of the garden fig. Theſe fruits have a ſleek, even ſkin; are of a deep green colour, and contain in their dry and meally inſide, ſeveral male and female flowers, placed upon diſtinct foot-ſtalks; the former above the latter.

The *fornites* appear in Auguſt, and continue to November, without ripening: in theſe breed ſmall worms, which turn to a ſort of gnats, no where to be ſeen but about theſe trees. In October and November, theſe gnats, of themſelves, make a puncture into the ſecond fruit, called *cratitires*. Theſe do not ſhew themſelves till towards the end of September. The *fornites* gradually fall away, after the gnats are gone; the *cratitires*, on the contrary, remain on the tree till May, and incloſe the eggs, depoſited by the gnats of the *fornites* when they pricked them. In May, the third ſort of fruit begins to put forth from the ſame wild fig-trees, which produced the other two: this is much bigger, and is called *orni*: when it grows to a certain ſize, and its bud begins to open, it is pricked in that part by the gnats of the *cratitires*, which are ſtrong enough to go from one fruit to the other to diſcharge their eggs.

It ſometimes happens that the gnats of the *cratitires* are ſlow to come forth in certain parts; while the *orni*, in thoſe very parts, are diſpoſed to receive them: in which caſe, the huſbandman is obliged to look for the *cratitires* in another part, and fix them at the end of the branches of thoſe fig-trees, whoſe *orni* are in fit diſpoſition to be pricked by the gnats. If they miſs the opportunity, the *orni* fall, and the gnats of the *cratitires* fly away. None but thoſe that are well acquainted with this culture, know the critical moment of doing

doing this; and in order to it, their eye is perpetually fixed on the bud of the fig; for that part not only indicates the time that the prickers are to iffue forth, but alfo when the fig is to be fuccefsfully pricked. If the bud be too hard, and too compact, the gnat cannot lay its eggs; and the fig drops when the bud is too open.

Thefe three forts of fruit are not good to eat; their office is to help to ripen the fruit of the garden fig-trees, in manner following: during the months of June and July, the peafants take the *orni*, at a time that their gnats are ready to break out, and carry them to the garden fig-trees; if they do not nick the moment, the *orni* fall, and the fruit of the domeftic or garden fig not ripening, will, in a very little time, fall in like manner. The peafants are fo well acquainted with thefe precious moments, that, every morning, in making their infpection, they only transfer to their garden fig-trees fuch *orni* as are well conditioned, otherwife they lofe their crop. It is true, they have one remedy, though an indifferent one, which is, to ftrew over the garden fig-trees, the *afcolimbros*, a very common plant there, and in whofe fruit there is a fort of gnats proper for pricking: perhaps they are the gnats of the *orni*, which are ufed to hover about, and plunder the flowers of this plant.

To fum up all in one word, the peafants fo well order the *orni*, that their gnats caufe the fruit of the garden fig-tree to ripen, in the compafs of forty days. Thefe figs are very good green; when they would dry them, they lay them in the fun for fome time, then put them in an oven, to keep them the reft of the year. Barley bread, and dried figs, are the principal fubfiftence of the boors and monks of the Archipelago; but thefe figs are very far from being fo good as thofe dried in Provence, Italy, and Spain: the heat of the oven deftroys all their delicacy and good tafte: but then, on the other hand, this heat kills the eggs, that the prickers of the *orni* difcharged therein, which eggs would infallibly produce fmall worms that would prejudice the fruits.

What an expence of time and pains is here for a fig, and that but an indifferent one at laft! I could not, fays Tournefort,

fort, (from whom this account is derived) fufficiently admire the patience of the Greeks, bufied above two months, in carrying thefe prickers from one tree to another. I was foon told the reafon; one of their fig-trees ufually produces between two and three hundred pounds of figs; but thofe in Provence, feldom above twenty-five.

The prickers contribute, perhaps, continues the fame learned naturalift, to the maturity of the fruit of the garden fig-tree, by caufing them to extravafate the nutritious juice, the veffels inclofing which they tear afunder, in depofiting their eggs; perhaps, too, befides their eggs, they leave behind them fome fort of liquor, proper to ferment gently with the milk of the figs, and to make their flefh tender. The figs in Provence, and even at Paris, ripen much fooner for having their buds pricked with a ftraw dipped in olive-oil. Plumbs and pears, pricked by fome infects, likewife ripen much the fafter for it: and the flefh round fuch puncture is better tafted than the reft. It is not to be difputed, that confiderable change happens to the contexture of fruits fo pricked, in like manner as to parts of animals pierced with any fharp inftrument.

Pontedera, in his *Anthologia*, fays, that in Italy, caprification is performed by gnats, which iffuing from the male figs of the wild fig-tree, *caprificus*, loaded with the duft of the ftamina, make a puncture into the female figs, that is, the autumn figs of the domeftic fig-tree; which they fecundate. This domeftic fig-tree, he calls fimply by the name of *ficus*; and remarks, that there is another fpecies, *erinofyce*, which, in fpring, bears figs, that, having many male-flowers, and few female, fall off before they ripen; and, in autumn, figs full of female flowers, and which do not ripen till the following fpring.

The caprification of the ancient Greeks and Romans, defcribed by Theophraftus, Plutarch, Pliny, and other authors of antiquity, correfponds, in every circumftance, with what is practifed, at this day, in the Archipelago, and in Italy. Thefe all agree in declaring, that the wild fig-tree, *caprificus*, never ripened its fruit; but was abfolutely neceffary

fary for ripening that of the garden, or domestic fig, over which the husbandman suspended its branches.

The species of wild fig-tree, called *ornos* in the Archipelago, grows likewise at Malta, where it obtains the name of *tokar:* the fruit, called by Tournefort, *fornites*, is stiled by the Maltese, *tokar-leouel*; the *cratitires*, *tokar-lanos*; and the *orni*, *tokar-taiept*. Besides this fig, there are seven or eight other domestic species in that island, of which they *caprify* but two. The first is that described by Tournefort, which only bears once a year; the second bears twice a year. The figs of the first crop, which is in the end of June, are sweet like honey, thicker, and much better than those of France, and arrive at perfect maturity without any assistance. Those of the second crop, are much smaller, inferior in quality to the former, and do not ripen till August, nor then, but by the assistance of caprification, without which, the greatest part of the fruit will fall off before maturity. The consequence, however, of this operation, is, that the fruit is greatly impoverished, and the first crop of the following year rendered much less. The caprified figs too, are generally yellow, and dry within; and not unfrequently inclose two or three gnats, some with, and some without wings.

In Provence and Spain, though the same species of figs are cultivated as in the Archipelago, and Malta, the curious husbandry in question has never yet been attempted. This neglect has certainly arisen from a prudent foresight, that the fruit gained not more in quantity by that operation, than it suffered in quality; for, although these countries do not produce the gnat, which is the principal agent of caprification, there is nothing in the nature of the climate, which would seem to oppose its introduction.

Pontedera, Linnæus, and others, have attributed the ripening of the seeds of the caprified fig-trees, to the fecundation of the *germina*, or seed-buds, by the dust of the stamina, conveyed to them, and lodged in their substance, by means of the gnats. In this view, caprification becomes a principal argument in supporting the curious doctrine of the sexes of plants; a doctrine, to an enlarged view of which we are

are indebted for one of the moſt ingenious, and uniform, though it muſt be acknowledged, one of the moſt artificial ſyſtems that ever appeared.

Upon the whole, from the various facts that have been collected upon this head, and which the reader will find diſperſed in different authors, we are led to conclude, that the principal object of caprification, thus naturally performed by the gnats, is to fecundate the ſeeds, which, without ſuch aſſiſtance, would not ripen, nor, of conſequence, produce kernels proper to nouriſh the young worms, and perpetuate their race.

We are now prepared to give a ſatisfactory anſwer to the other queſtion propoſed in the beginning of this article. "How it happens, that the fruit of our fig-trees ripen, if the plants are of one ſex only, and have no aſſiſtance from the male?"

The queſtion ſuppoſes, that the fig-trees, in this country, bring fruit to maturity without the aſſiſtance of caprification; and the fact cannot be denied. The ſame thing, we have ſeen, obtains in Spain, Provence, and Malta; but the fruit, or, more properly, the fruit-veſſel, is, in all caſes, to be diſtinguiſhed from the ſeed contained within it. If the male be wanting, the ſeed will not vegetate when ſown; but the fruit may nevertheleſs ſwell, and come to an appearance of perfection: and ſo it is obſerved to do in the inſtance in queſtion, and in many others, eſpecially where the fruit is formed of one of the parts leſs connected with the ſeed, as the calyx, receptacle, &c. though it is more common for it to drop off before it ripens, if not impregnated by the male.

Fig-trees, then, in this country, ripen their fruit, but not their ſeed; and can therefore be propagated only by layers, ſuckers, or cuttings. But the ſummer figs of Paris, Provence, Italy, and Malta, ripen not their fruits only, but their ſeed, without the aſſiſtance of caprification; as is evident from the trees being frequently raiſed from ſeed. To account for this ſeeming paradox, I would obſerve, that the cultivated fig-trees have a few male-flowers, placed above the

the female, within the fame covering, or receptacle; that in Spain, Italy, and the warm climates, thefe male-flowers are perfect, and perform their proper office in fecundating the female: But that in colder climates, as that of England, and even in late feafons in a warm climate, the ftamina of the male flowers prove abortive, and no fecundation of the feed can enfue.

Mr. de la Hire has demonftrated, in the Memoirs of the Academy of Sciences, that the fummer-figs at Paris, in Provence, Italy, and Malta, have all ftamina of a perfectly proper and regular conformation; and that the ftamina of the autumn figs, in the fame places, are abortive. Of this abortion, two caufes have been affigned: 1, that the figs appear at a time, when the leaves, already old, perfpire but little, and receive a very fmall fupply of nourifhment from the root: 2, that being much more numerous than the fummer-figs, they require a greater fupply of nourifhment than the trees are, at that feafon, able to afford them.

CAPSULA, (diminutive from *capfa*, a box, coffer, or cafe) a little cheft, or cafket; a capfule. A dry, hollow feed-veffel, that cleaves, or fplits, in fome determinate manner. *Vide* PERICARPIUM.

This fpecies of feed-veffel is frequently flefhy and fucculent, like a berry, before it has attained maturity; but in ripening, becomes dry, and often fo elaftic as to dart the feeds from their departments, with confiderable velocity. This elafticity is remarkably confpicuous in wood-forrel; balfam, *impatiens*; African fpiræa, *diofma*; fraxinella; *jufticia*; *ruellia*; *barleria*; *lathræa*, and many others.

The general aptitude or difpofition of this fpecies of feed-veffel, to cleave or feparate, for the purpofe of difperfing its feeds, diftinguifhes it, not lefs remarkably than its texture, from the pulpy, or fucculent fruits of the apple, berry, and cherry kind.

This opening of the capfule for difcharging the feeds when the fruit is ripe, is either at the top, as in moft plants; at the bottom, as in *triglochin*; at the fide, through a pore, or fmall hole, as in campanula, and orchis: horizontally,

as

as in plantain, amaranthus, and anagallis; or longitudinally, as in convolvulus.

All fruit that is jointed opens at every one of the joints, each of which contains a ſingle ſeed.

Capſules, in ſplitting, or opening, are divided, externally, into one or more pieces, called by Linnæus *valves*. *Vide* VALVULA.

The internal diviſions of the capſule are called cells, *loculamenta*; theſe, in point of number, are exceedingly diverſified; ſome capſules have only one cell, as the primroſe; others many, as the water-lily. For particulars on this ſubject, the reader is referred to the article LOCULAMENTA.

The number of capſules is generally the ſame as that of the *germina*, or ſeed-buds: for the ſeed-veſſel is nothing elſe than the ſeed-bud arrived at maturity.

We may obſerve, however, that when a flower contains a number of ſeed-buds with an undivided cavity, that is, a ſingle cell, theſe ſeed-buds, in the progreſs of vegetation, unite, and become detached, or ſeparate cells of the ſame membranous capſule.

The ſeed-veſſel conſiſts of one capſule, in lychnis; of two in pæony, and ſwallow-wort; of three in lark-ſpur, and white hellebore, *veratrum*; of four in roſe-root, *rhodiola*; of five in columbine; and of many in globe ranunculus, and marſh marigold.

The partitions which divide the capſule internally into cells are called by Linnæus, *Diſſepimenta*; and the ſubſtance which connects theſe partitions to the ſeeds, *Columella*.

In convolvulus; thorn-apple, *datura*; and chick-weed; the partitions, juſt mentioned, ſeparating, or detaching themſelves from the top of the fruit, before its maturity, open a communication betwixt the cells, and thus render the cavity of the capſule undivided; which, in its ſtate of *germen*, or ſeed-bud, conſiſted of numerous diviſions, or cells. As the ſame thing may happen, from accidental cauſes, in many other plants, it would not be improper previouſly to aſcertain the number of cells, as they exhibit themſelves in a tranverſe ſection of the ſeed-bud, in which

every

every thing reſpecting the future fruit may be viewed in miniature. Without this precaution, numberleſs miſtakes will be committed in fixing and diſcovering the genera of ſeveral plants; as of honey-ſuckle, cardinal flower, and others.

The terms *valvula*, *diſſepimentum*, *loculamentum*, and *columella*, which Linnæus, in the Philoſophia Botanica, conſiders as ſo many members, or diſtinct parts of that ſpecies of ſeed-veſſel called *capſule*, are applied, at leaſt ſome of them, with equal propriety, to any kind of dry ſeed-veſſel.

Note. Pulpy ſeed-veſſels of the apple kind, *pomum*, contain a capſule. *Vide* Pomum.

Capſules conſiſting of three cells, each of which contains a ſingle ſeed, are denominated by Linnæus, *Capſulæ Tricoccæ*. Of this ſort are the ſeed-veſſels of *euphorbia*; mercury; papaw; palma-chriſti; jack in a box, *hernandia*; baſtard-orpine, *andrachne*; and the remaining genera, in the thirty-eighth order of Linnæus's Fragments, entitled *tricoccæ* from that circumſtance. *Vide* Tricoccæ.

A capſule is either

Acuminata, pointed, tapering to a point, as in lilac.

Trigona, three-cornered; as in Indian arrow-root, *maranta*.

Scabra, rough with knots; as in Indian flowering-reed, *canna*.

Hiſpida, ſhaggy or briſtly; as in enchanter's night ſhade, *circæa*.

Ovata, egg-ſhaped; as in *pæderota*.

Subrotunda, roundiſh; as in Indian flowering-reed.

Globoſa, round, of a globular form; as in water-milfoil, *utricularia*.

Ventricoſa, big-bellied; as in corn-flag, *gladiolus*.

Oblonga, longer than broad; as in iris.

Triſulcata, having three grooves, or furrows; as in Indian flowering-reed, *canna*; and the genus *moræa*.

Nuda, naked, oppoſed to *hiſpida*; as in *commelina*.

Turbinata, ſhaped like a top; as in *montia*.

Emarginata, deficient in its margin, notched; as in Carolina-flax, *polypremum*.

Bisulca, furnished with two furrows; as in *buddleia*.

Teres, slender, and cylindrical; as in primrose, and *soldanella*.

Coronata, crowned with the calyx; as in most plants which have the seed-bud placed below the receptacle of the flower.

Pentacocca, having five cells, each containing a single seed; as in *byttneria*.

Colorata, coloured; as in staff-tree, *celastrus*.

Muricata, prickly; as in *byttneria*.

Succulenta, succulent, pulpy; as in spindle-tree, *euonymus*.

Lignosa, of a woody substance; as in *cedrela*.

Coriacea, of a substance like leather; as in *cupania*.

Inflata, blown up, swelled; as in bladder-nut, *staphylæa*; and lesser flowering rush, *scheuchzeria*.

Compressa, flat, pressed together: as in lesser orpine, *crassula*; and water plantain, *alisma*.

Carnosa, fleshy, or pulpy; as in *pontederia*.

Pellucida, thin, and transparent; as in superb lily, *gloriosa*.

Flaccida, feeble, flaccid; as in bladder-nut.

Glabra, having a smooth even surface; as in squill, *scilla*; and spider-wort, *anthericum*.

Cordata, heart-shaped; as in water-purslane, *peplis*.

Obcordata, heart-shaped with its tip downwards; as in speedwell.

Conica, of a conic form; as in *pontederia*.

Striata, superficially furrowed; fluted; as in French-willow, *epilobium*.

Lanceolata, shaped like a lance; as in log-wood, *hæmatoxylum*.

Semivalvis, and *semivalvata*, having only half a valve; as in prickly-poppy, *argemone*.

Echinata, (from Ἐχῖνος, a hedge-hog); beset with prickles; as in *sloanea*, and Indian-mallow, *urena*; synonimous to *muricata*. *Vide Supra*.

Alata, winged; as in *seguieria*.

Tomentosa,

Tomentosa, downy; as in pæony. *Vide* TOMENTUM.

Lunulata, crescent-shaped; as in *isopyrum*.

Bicarinata, having two prominences like the keel or bottom of a ship; as in hellebore, and marsh-marigold.

Elastica, bursting like a spring; as in *lathræa*, and *elaterium*. *Vide Supra*.

Farinacea, having a mealy sort of pulp; as in Æthiopian four-gourd, *adansonia*.

Tricarinata, having three keels; as in orchis; *satyrium*; and several other genera of the class *Gynandria* of Linnæus.

Columnaris, shaped like a pillar; as in *limodorum*, and *nepenthes*.

Bicornis, resembling two horns; as in *ceratocarpus*.

Dicocca, having two cells, each containing a single seed; as in *solandra*.

Scrotiformis, shaped like the *scrotum* in animals; as in mercury.

Tricornis, resembling three horns; as in bastard-hemp, *datisca*.

Didyma, twin-capsules; two united in one; as in mercury, and many other plants.

Dr. Grew, in his Anatomy of Plants, distinguishes all dry seed-vessels, whether capsules or pods, by the name of *seed-cases*, or *membranous uteri*; in opposition to the pulpy seed-vessels of the apple, berry, and cherry kind, which he denominates fruits.

From the curious mechanism of these seed-cases, says that learned author, may be easily understood the reason of the violent and surprizing ejaculation of the seeds, observed in many plants. This is not a motion originally in the seeds themselves; but contrived by the structure of the case, (*seed-vessel*.) For the seeds hanging very loose, and not on the sides of the case, as sometimes, but on a *pole*, or column, in the centre, with their thicker end downward, they stand ready for a discharge: and the sides of the case being lined with a strong and tense membrane, they perform the office of so many little bows, which remaining fast at top, and opening, or being let off at the bottom, curl forcibly upward, and so drive all the seeds before them.

This

This obſervation, which the learned author particularly applies to a ſpecies of *polygonum*, is equally applicable to the elaſtic ſeed-veſſels of other plants.

CAPSULA *Staminis*. The ſummits of the *ſtamina*. Malpighi's term for the *Anthera* of Linnæus, and *Apex* of Ray. *Vide* ANTHERA and APEX.

CARINA, a keel. The name which Linnæus gives to the lower concave petal of a pea-bloom, or butterfly-ſhaped flower, from its fancied reſemblance to the keel of a ſhip. *Vide* COROLLA and DIADELPHIA.

The keel is placed cloſe under the upper petal, called the ſtandard, *vexillum*; and within the two ſide petals, called wings, *alæ*. *Vide* VEXILLUM, and ALÆ.

It incloſes the *ſtamina*, and *piſtillum*; and conſiſts either of one petal, as in *cytiſus*; or of two adhering pretty cloſely together; as in broom, *ſpartium*; and coral-tree, *erythrina*.

The *Carina* is either

Lunulata, ſhaped like a creſcent; as in *piſcidia*, and *borbonia*:

Bifida, ſlightly cut in two; as in African-broom, *aſpalathus*:

Spiralis, ſpirally twiſted; as in kidney-bean, *phaſeolus*:

Incurva, turning back; as in ground nut, *arachis*:

Ventriculoſa, bellying out in the middle; as in baſe tree trefoil, *cytiſus*: or

Compreſſa, flat, that is, preſſed together at the ſides; as in falſe acacia, *robinia*; and milk-wort, *polygala*.

The line that forms the keel in this irregular petal, runs ſtraight as far as the middle, and then riſes in the ſegment of a circle: but the marginal line runs ſtraight to the *apex*, where the two lines meet, and terminate obtuſely.

The lower part of the baſe of the keel extends into a claw, which is inſerted into the common receptacle, and of the length of the calyx.

The ſides are ſimilar to the wings, both in ſhape and ſituation, except that they are lower, and ſtand within them.

CARYOPHYLLÆUS *Flos*, (from *caryophyllus*, Tournefort's name for the clove-gilly flower, or carnation pink, and

and the clove-tree.) A flower, whofe petals, generally five in number, are difpofed like thofe of the clove-gilly flower. Thefe are the flowers *en œillet* of French writers. They have a hollow calyx or empalement of one piece, into the bottom of which are inferted the claws of the petals. Thefe are of the fame length with the calyx. The upper part of the petals is broad, plain, and difpofed on the margin of the empalement like a wheel.

Under this defcription are included, cucubalus; lychnis; vifcous campion, *filene*; ftellaria; ceraftium; and feveral other plants, to be afterwards enumerated.

CARYOPHYLLEI, the name of the eighth clafs in Tournefort's, and fixteenth in Pontedera's method, confifting of *herbaceous* vegetables, whofe flowers anfwer to the defcription given above.

Carnation; pink; clove-tree; lychnis; foapwort; cucubalus; flax, *linum*; and thrift, or fea-gilly flower, *ftatice*; are the caryophyllei of Tournefort.

CARYOPHYLLEI, is likewife the name of a very numerous family, or order, in Linnæus's Fragments of a Natural Method: containing, befides the clafs of the fame name in Tournefort, many other plants, which, from their general appearance, feem nearly allied to it.

Lift of the Genera *contained in this Natural Order.*

SECTION I.

Carnation-like plants with a hollow calyx of one piece, and five petals. (This feems to be Tournefort's idea of a clove-like flower.)

Linnæan Genera.	English Names.
Agroftemma, — —	Campion, or wild Lychnis.
Cucubalus, — —	Berry-bearing Chick-weed.
Dianthus, — —	Clove-gilly-flower, or Carnation-pink.
Drypis.	
Gypfophila.	
Lychnis, — —	Campion.

Saponaria,

Linnæan Genera.			*English Names.*
Saponaria,	—	—	Soap-wort.
Silene,	—	—	Vifcous Campion.
Velezia.			

SECTION II.

Carnation-like plants with a calyx of more pieces than one, and five petals.

Alſine,	—	—	Chick-weed.
Arenaria,	—	—	Sandwort.
Bufonia.			
Ceraſtium,	—	—	Moufe-ear chick-weed.
Cherleria.			
Glinus.			
Holoſteum.			
Loeflingia.			
Moehringia,	—	—	Mountain chick-weed.
Polycarpon.			
Sagina,	—	—	Pearl-wort.
Spergula,	—	—	Spurrey.
Stellaria,	—	—	Great chick-weed.

SECTION III.

Carnation-like plants with a calyx of more pieces than one, and no petals.

Minuartia.
Mollugo.
Ortegia.
Pharnaceum.
Queria.

To this order have been annexed, fomewhat improperly indeed, two other *genera*, which cannot be arranged under any of the foregoing fections. Thefe are,

Polypremum, Carolina flax.

Scleranthus, German knot-grafs, or knawel.

The former has a calyx of four pieces, and one wheel-

ſhaped

ſhaped petal; the latter a hollow calyx of one piece and no petals.

Habit and Structure of the Plants of this Order.

All the plants of this order are herbaceous, and moſtly annual. Some of the creeping kinds do not riſe an inch; and the talleſt exceed not ſeven or eight feet.

The ROOTS are branched, fibrous, and of a moderate length.

The STEMS are cylindrical.

The BRANCHES proceed from the wings or angles of the leaves, and are generally oppoſite, and, as it were, jointed at each knot. In ſome ſpecies of *Ceraſtium*, the branches are ſquare.

The LEAVES are generally placed oppoſite in pairs, ſo as to reſemble a croſs; and are ſlightly united at the bottom, by their foot-ſtalks, which form a ſort of glove round the ſtem. In *Glinus*, the leaves ſurround the ſtalk in greater numbers in whirls, or whorls, (*verticilli*); and in a ſpecies of ſoap-wort, mentioned by Mr. Adanſon, they are placed alternate.

The HAIRS, (*Pili*) are ſimple, like ſilk.

The FLOWERS in this order are hermaphrodite; that is, have their ſtamina and pointal, *piſtillum*, within the ſame covers.

Lychnis dioica, cucubalus otites, and *gypſophila paniculata*, have male and female flowers upon diſtinct roots, and are, therefore, very improperly placed by Linnæus, in a claſs, which, according to his plan, ſhould conſiſt of hermaphrodite flowers only.

The Flowers either ſtand ſingle on their foot-ſtalks, and proceed from the wings, or angles, of the leaves and branches; or are diſpoſed in a SPIKE, CORYMBUS, UMBEL, or PANICLE. *Vide* SPICA, CORYMBUS, &c.

The CALYX, or flower-cup, is permanent, and compoſed either of one piece with five indentments, as in plants of the firſt ſection; or of four or five diſtinct leaves, as in thoſe of the ſecond and third. In clove-gilly flower, the baſe of the *calyx* is ſurrounded with four ſmall leaves or ſcales, of which the two lower are oppoſite.

The

The COROLLA in this order generally conſiſts of five petals, which, in plants of the firſt ſection particularly, have claws of the length of the *calyx*; and a ſpreading limb, ſometimes entire, but oftener cleft, or divided into two, as in *cucubalus* and viſcous campion.

Several ſpecies of *lychnis*, *ſilene*, and carnation, are rendered double by culture.

Buſonia; *ſagina*; and mountain chick-weed, *mœhringia*; have four petals: *polypremum*, but one, which is wheel-ſhaped, and has its limb, or upper part, deeply divided in four.

In *Drypis*, the jaws of the tube of the corolla, (*faux*,) are furniſhed with a ſet of ſmall teeth, (*denticuli*); which ſerve as an eſſential mark in diſtinguiſhing the genus.

In viſcous campion, *ſilene*, the neck of each petal is indented with two ſmall teeth of the ſame kind, which crown the jaws of the tube, and diſtinguiſh that genus from *cucubalus*, to which it is otherwiſe very nearly allied.

Theſe appearances are reduced by Linnæus under his general term NECTARIUM, which, by the way, includes every ſingularity in the flower, whether connected with the petals, as in the preſent inſtances, or not. *Vide* COROLLA and NECTARIUM.

The STAMINA are, in number, from three to fifteen, and of a moderate length. When their number is double the diviſions of the *calyx*, as in *ſilene*, and moſt of the plants of the firſt ſection, they are attached alternately to the claws of the petals; thoſe ſo attached, being ſhorter than the reſt. The remaining ſtamina are inſerted into the common receptacle, and ſtand oppoſite to the ſegments of the *calyx*.

Note. The *filaments* in german knot graſs, *ſcleranthus*, are inſerted into the *calyx*.

Ceraſtium pentandrum, and *ſpergula pentandra*, have only five ſtamina, as the ſpecific name imparts; although the genera *ceraſtium* and *ſpergula*, belong to a claſs in Linnæus's ſyſtem, whoſe characteriſtic it is to have ten ſtamina. Theſe ſpecies ought certainly to have been arranged as diſtinct genera, or as particular ſpecies of other genera in the claſs *pentandria*. But improprieties of this, and even of a worſe

 kind,

kind, are very common in the ſexual method of arrangement.

In ſome genera of this order, the number of ſtamina is found to vary, even in the different flowers of the ſame plant: thus chick-weed, *alſine*, has ſome flowers with ten ſtamina, though the greater number are furniſhed only with five.

The ANTHERS, or ſummits, are ſhort, hemiſpherical, marked with four longitudinal furrows, frequently divided or cleft below, moſt commonly erect, ſometimes, however, *incumbent*; that is, faſtened to the filaments by the ſides, as in *drypis*, and *lychnis*. *Loeflingia*, *bufonia*, & *glinus*, have twin-anthers, *anthera didyma*; that is, two anthers are placed upon each filament.

Note. The petals and ſtamina in this order, as well as the *calyx*, generally accompany the ſeed-bud to its maturity.

The POINTAL, (*Piſtillum*,) is compoſed of a ſingle SEED-BUD, which is generally roundiſh, ſometimes cornered, ſupporting either one ſtyle, as in *loeflingia*; two, as in *bufonia* and clove-gilly flower; three, as in *mollugo*, *cucubalus*, and viſcous campion; or five, as in *lychnis*, *agroſtemma*, and *glinus*.

Theſe STYLES are thread-ſhaped, of the length of the *ſtamina*, and crowned with a ſimple STIGMA, which is ſleek or ſmooth externally, and ſlightly hollowed or vaulted within.

In ſome ſpecies of pink, *dianthus*, the two ſtyles are much longer than the ſtamina; and the tops, or *ſtigmata*, are rolled back for the purpoſe of impregnation, according to the ſexualiſts.

The SEED-VESSEL is a dry capſule, of an oval form, of the length of the *calyx*, and conſiſts of one cell, as in clove gilly flower, *lychnis*, and ſoap-wort; or of three, as in viſcous campion, and *cucubalus*.

The SEEDS are numerous, ſmall, and generally kidney-ſhaped.

Note. Drypis has only one ſhining kidney-ſhaped ſeed.

The plants of this order are innocent in their quality; they

they abound in a watery fort of phlegm, and have bitter feeds.

With refpect to their virtues, they are reckoned aftringent, attenuating, and deterfive.

The feeds of *lychnis*, according to Diofcorides, were formerly applied as a proper remedy againft the poifonous bites of ferpents: and in modern times, phyficians have ufed them with fome fuccefs in preventing that putrefaction of the humours, which is apt to attend a continual ufe of fpirituous liquors, particularly gin.

Burman relates in his *Thefaurus Zeylanicus*, that a particular fpecies of Indian Lychnis, termed by the natives of Ceylon, Wifaduli, that is, pain-alleviating powder, is ftill ufed with efficacy, in counteracting the poifon occafioned by the bites of venomous animals. For this purpofe, the feeds reduced to a very fine powder, are fprinkled over the part affected, which never fails to remove the inflammation, and produce a fpeedy cure.

Officinal foap-wort is a moft powerful refolver of obftructions formed by fat and vifcid matter collected in the veffels and bowels. It provokes the *menfes*, and is ufed in the afthma and venereal difeafe. The Leaves are externally applied to hard tumours and whitloes. A decoction of the herb is ufed to cleanfe and fcour woollen-cloths; and in fome countries, the poor people ufe it inftead of foap for wafhing, from which it derives its title.

The root of *Gypfophila faftigiata*, boiled with linen and woollen cloths, poffeffes a like cleanfing quality: and hence, by Haller and other Botanifts, this plant is ranked with the foap-worts.

The chick-weed of the fhops, the *alfine media* of Boerhaave, grows in watery places, by the fides of hedges and paths. The herb is in ufe: it refrigerates and moiftens, and has the virtues of pellitory of the wall, but has no aftringency. It is reckoned nutritive, and therefore a wholefome food for perfons in an atrophy, or confumption. The diftilled water of chick-weed, or the infufion of it in wine, reftores thofe who are emaciated after long difeafes. The

root powdered, being laid on the piles, ſtops their immoderate flux, and aſſuages the pain. The juice is vulnerary, and cleanſing, and employed with ſucceſs in inflammations and pains of the eyes.

A ſpecies of *cucubalus*, called by Miller *cucubalus latifolius*, grows naturally in moſt parts of England, where it is generally known by the name of ſpatling poppy. It ſtands in the catalogue of medicinal plants, under the title of *Behen album*; the roots are ſometimes uſed, and accounted cordial, cephalic, and alexipharmic.

Linnæus relates in his *Flora Suecica*, that by the natives of Gothland, the leaves of *Cucubalus Behen*, or Bladder Campion, are applied externally with ſucceſs in the Eryſipelas.

The flowers of ſome ſpecies of *cucubalus*, and viſcous campion, *ſilene*, are cloſed all day; but when the ſun leaves them, they expand, and have a very agreeable ſcent. From this ſingular circumſtance, ſuch plants are termed *noctifloræ*, flowering in the night-time.

Alſine media wakes, that is, expands its flowers from nine in the morning to noon, unleſs rain fall, in which caſe it does not open that day. Next day, it droops, nor does it recover its erect poſition till a conſiderable time afterwards.

The flowers of *Arenaria rubra* open betwixt nine and ten in the morning, and cloſe betwixt two and three in the afternoon.

A ſpecies of *Dianthus* (pink,) which grows naturally in European and Aſiatic Turkey: is termed by Linnæus *pomeridianus*, from the circumſtance of its always opening its flowers at half-paſt twelve at noon. They generally ſhut at ten in the evening. *Vide Vigiliæ* PLANTARIUM.

An inſect of the genus *chermes* of Linnæus, which infeſts the flowers of clammy campion (*Ceraſtium viſcoſum*) often produces ſo remarkable a change, that the leaves of the calyx become thrice as large as in their natural ſtate, and are inflated, with their tips bent inwards; the petals too become green, and are permanent.

In a ſpecies of *cucubalus*, called *gumſepungar* in Sweden, the

the flower-cup is curiouſly veined like net-work. That of our common ſort is plain.

From the joints of the ſtalks of *cucubalus otites*, there oozes a viſcous clammy juice, which ſticks to the fingers when handled, and hinders ſuch inſects as ſettle upon thoſe parts of the ſtalks from getting looſe again. The name of catch-fly has been given to a ſpecies of lychnis, and viſcous campion, which poſſeſs a glutinous quality of the ſame fatal effects to flies and other inſects.

The leaves of a variety of common ſoap-wort, called *ſaponaria hybrida*, and generally eſteemed a *luſus naturæ*, are hollowed like a ladle.

CASTRATIO, a term uſed by modern botaniſts, derived from the fancied analogy betwixt plants and animals. CASTRATION.

The caſtration of plants conſiſts in cutting off the *anthers*, or tops of the ſtamina, before they have attained maturity, and diſperſed the *pollen*, or fine duſt contained within their ſubſtance. This operation has been frequently practiſed by the moderns, with a view to eſtabliſh or confute the doctrine of the ſexes of plants: the *anthers*, or tops, being conſidered by the ſexualiſts as the male organ of generation.

The experiment of caſtration ſucceeds principally on plants, which, like the melon, have their male flowers detached from the female. In ſuch as have both male and female flowers contained within the ſame covers, this operation cannot be eaſily performed without endangering the neighbouring organs.

The reſult of the experiments on this curious ſubject by Linnæus, Miller, Alſton, and other eminent naturaliſts, may be ſeen under the article *Sexes of Plants*, whither we refer our reader. *Vide* SEXUS.

CATULUS, catkin. *Vide* AMENTUM.

CAUDEX, (*vel codex, proprie truncus arboris; ſic dictus,* ſays Voſſius, *videtur a caido ſive cædo, quia in plures ſecaretur tabulas craſſas, quarum etiam contextus caudex propterea dicebatur*); by Malpighi and other botaniſts, is uſed to ſignify the ſtem or trunk of a tree: by Linnæus, the ſtock or body of the

the root, part of which aſcends, part deſcends. The aſcending part raiſes itſelf gradually above ground, ſerving frequently for a trunk, and correſponds, in ſome meaſure, to the *caudex* of former writers: the deſcending part ſtrikes gradually downward into the ground, and puts forth radicles, or ſmall fibres, which are the principal and eſſential part of every root. *Vide* RADICULA.

The deſcending *caudex*, therefore, correſponds to the *radix* of other botaniſts. *Vide* RADIX.

Agreeably to this idea, Linnæus conſiders trees and ſhrubs as roots above ground; an opinion which is confirmed by a well known fact; that trees, when inverted, put forth leaves from the deſcending caudex, and radicles or roots from the aſcending. *Vide Phil. Bot.* p. 38, 39.

For the varieties in the ſtructure of the deſcending *caudex*, ſee the article RADIX.

CAULESCENS *Planta*, (from *caulis*, the ſtem); having a ſtem or trunk, as moſt plants, oppoſed to *acaulis*. *Vide* ACAULIS.

CAULIS, (from Καυλος,) a ſtalk or ſtem; the firſt and moſt common ſpecies of trunk, defined by Linnæus, in his *Philoſophia Botanica* to be the proper trunk of the *herb*, which elevates the leaves, flower, and fruit. *Vide* HERBA.

To this deſcription may be added another circumſtance, that *caulis* is an univerſal trunk; that is, proceeds immediately from the root: whilſt the foot-ſtalks of the flower and leaf, which Linnæus likewiſe denominates trunks, are partial, that is, proceed from an univerſal trunk, or its branches.

The ſtalks of the graſſes, palms, ferns, and muſhrooms, being of a very ſingular nature, are diſtinguiſhed by particular names.

For the different ſpecies of trunks enumerated by Linnæus, ſee the article TRUNCUS.

Note. The term *caulis*, which is now equally applied to herbs and trees, was formerly applied to herbs only: the terms *caudex*, *ſtipes*, and *truncus*, being uſed to denote the ſtem or trunk of trees and ſhrubs. *Vide* CAUDEX, &c.

A ſtem

A ſtem is either ſimple or compound.

SIMPLE ſtems are ſuch as do not divide, but proceed in a continued ſeries towards their ſummits.

COMPOUND ſtems are ſubdivided into *ramuli*, or ſmall branches, and diminiſh as they aſcend, ſo as frequently to loſe the appearance of a ſtem altogether.

Simple Stems.

Theſe are either totally entire, *caules integri*; or ſend out ſmall lateral branches, *caules ramoſi*.

Simple undivided Stems.

In this manner, I have thought proper to tranſlate the *caules integri* of Linnæus, as ſtanding oppoſed to *caules ramoſi*. I cannot, at the ſame time, help remarking, that Linnæus's explanation of this term, affords an inſtance of the great inaccuracy which ſtill prevails in botanical language. In the *Philoſophia Botanica*, he explains it by the word *ſimpliciſſimus*, and adds, *ramis vix ullis*; but in his *Delineatio Plantæ*, he gives us *ſimpliciſſimus* as a ſeparate term; it ſhould ſeem therefore, that *ramis vix ullis* belongs to *ſimpliciſſimus*; and to *integer*, *ramis nullis*, which ſenſe I have given it. In Elmgren's *Termini Botanici*, reviſed by Linnæus, we have a new explanation of *caulis integer*, viz. *ſimpliciſſimus*, *ramis anguſtatis*; the former addition, *ramis vix ullis*, is transferred to the term *ſimpliciſſimus*.

Caulis Nudus, a naked ſtem, that is, devoid of leaves and hair. Linnæus, in his *Philoſophia Botanica*, applies this term to ſuch trunks as want the leaves alone; but as in the *Delineatio Plantæ*, and the *Termini Botanici*, he makes it a diſtinct term from *Aphyllus*, which, from its etymology, is expreſſive of the want of leaves, he muſt intend that it ſhould imply entire nakedneſs, in oppoſition not to *foliatus* only, but alſo to *ſcaber*, *villoſus*, *hiſpidus*, *ſetaceus*, and other terms importing roughneſs and pubeſcence. When applied to leaves, *nudus* is evidently taken in this ſenſe.

Melon-thiſtle, dodder, burning thorny-plant, ſhrubby horſe-tail, and *ſtapelia*, afford inſtances of the naked ſtem alluded to.

Caulis Foliatus, a ſtem covered with leaves; as in the corn-flag, and moſt plants; oppoſed to *aphyllus*, and the foregoing term.

Caulis Flexuoſus, a ſtem which takes a different direction at every joint; as in rough bindweed, *ſmilax*; and ſhrub trefoil, *ptelea*.

Caulis Volubilis, a twining or winding ſtem; that is, which aſcends ſpirally round the branch or ſtem of ſome other plant. The courſe of ſuch ſtems is either to the left, according to the apparent diurnal motion of the ſun, as in honey-ſuckle, hop, buck-wheat, and black bryony; or to the right, contrary to that motion, as in convolvulus, burning thorny-plant, Malabar night-ſhade, kidney-bean, and hemp-agrimony.

Caulis Reclinatus, bending in an arch towards the earth, as in the fig-tree.

Caulis Procumbens, lying along the ground, without putting forth roots; ſynonimous to *proſtratus*, and exemplified in the leſſer ſea-bindweed, *convolvulus ſoldanella*.

Caulis Repens, a creeping ſtem, running along the ground, and ſtriking root at certain diſtances; in which reſpect it differs from the foregoing term. It is exemplified in ivy, and the trumpet flower, *bignonia*.

Caulis Sarmentoſus, (from *ſarmentum*, a vine-twig). This ſpecies of ſtem ſtrikes root as the former; but is almoſt naked, that is, without leaves, except immediately above each knot of *radiculæ*, or little roots, where a few leaves are produced in bunches.

Caulis Paraſiticus, a ſtem not growing out of the ground, but ſupporting itſelf like a paraſite on ſome other plant; as in vanilla, dodder, miſletoe, and *tillandſia*.

Caulis teres, ſhaped like a cylinder.

Caulis anceps, two-edged, compreſſed and forming two oppoſite acute angles; as in *ſiſyrinchium*.

Caulis triqueter, having three plain or flat ſides; as in *viola tricolor*.

Caulis triangularis, having three angles.

Caulis trigonus, having three angles, as the former, with the ſides concave or convex.

Caulis

Caulis Sulcatus, furrowed, marked with deep grooves, or channels, through the whole length.

Caulis Striatus, from *ſtria*, (a ſlight or ſuperficial groove); fluted, marked with ſlight, parallel channels, or grooves, through the whole length.

Caulis Glaber, having a ſmooth or even ſurface; oppoſed to

Caulis Scaber, rough, ſcabby, covered with ſmall rigid projecting points, or tubercles.

Caulis Villoſus, from *villus*, wool; hairy, or ſhaggy; covered with down, or ſoft hairs; woolly; as in ſumach, *tomex*, and common furze, *ulex europæus*.

Caulis Hiſpidus, briſtly, covered with ſtiff fragile briſtles, or prickles, whoſe roots are only ſuperficial, ſo as to be detached with the rind. *Vide* ACULEUS.

Note. The term expreſſes a great degree of roughneſs, and is exemplified in *braſſica erucaſtrum*.

Simple Branching Stems.

Caulis Adſcendens. The ſtem is ſo called when the branches grow firſt in a horizontal direction, and then gradually curve upwards.

Caulis Diffuſus, diffuſed, that is, with ſpreading branches; as in the common water germander.

Caulis Diſtichus, (from δις, twice, and στιχος, a rank, or row); having the branches horizontal, and produced in two rows; in other words, when the branches all proceed from two ſides of the ſtem only.

Caulis brachiatus, from *brachium*, the arm; having arms, branching in pairs, each pair ſtanding at right angles with thoſe above and below.

Caulis Ramoſiſſimus, abounding with branches diſpoſed without any regular order.

Caulis Fulcratus, from *fulcrum*, a prop. The ſtem ſo called, when ſupported by the branches which deſcend to the root; as in the fig-tree, and that curious aquatic, mangrove, the *rhizophora* of Linnæus.

Caulis Prolifer, ſhooting forth branches only from the

center of the *apex*; as in the fir, pine, cedar, and larch trees.

Caulis Simpliciſſimus, moſt ſimple, having very few branches, and proceeding in a ſtraight line up to its *apex*; exemplified in the *lathræa ſquamaria*.

The reſt as in entire ſtems.

Compound Stems.

Caulis Dichotomus, (from δις, twice, and τέμνω, to cut); a forked-ſtalk; when the diviſions are made by two and two; as in horned chickweed, *ceraſtium dichotomum*; and eaſtern ſoap-wort.

Caulis Sudiviſus, divided into branches irregularly, or without order.

Caulis Articulatus, jointed; having knots or joints at certain diſtances; as in pepper and glaſs-wort.

The ſtem often furniſhes eſſential marks of diſtinction. Thus many ſpecies of St. John's wort, lily of the valley, and French honey-ſuckle, are diſtinguiſhable only by the angles of the ſtem; and in the genus *lupinus*, the ſpecies are ſcarce to be known, except by the ſame part being ſimple or compound.

Obſervations on the reciprocal relations which ſubſiſt betwixt roots and ſtems are referred to the general head TRUNCUS, which ſee.

CEREALIA, from *Ceres*, the goddeſs of corn. Linnæus's name for the larger eſculent ſeeds of the graſſes; theſe are rice, wheat, rye, barley, oats, millet, panic graſs, Indian millet, *holcus*; *zizania*, and mays. To this head may be likewiſe referred darnel, *lolium*; which by preparation is rendered eſculent. *Vide Phil. Bot.* p. 279.

CESPITITIÆ, from *ceſpes*, a ſod, or turf; the name of a claſs in Sauvage's *Methodus Foliorum*, conſiſting of plants which have only radical leaves, that is, leaves proceeding from the root; ſuch are the primroſe, ſome ſpecies of leopard's-bane, ſea-pink, aloe, garlic, crown imperial, narciſſus, rhubarb, ſow-bread, cuckow-pint, navel-wort, the lichens, and many others.

This

This clafs in Sauvage's Method includes all thofe plants which have the fpecies of trunk or ftem called by Linnæus *fcapus*. *Vide* SCAPUS.

CESPITOSA *Planta*, a plant fo termed, which produces many ftems from one root, thereby forming a clofe thick carpet on the furface of the earth.

Multitude or quantity, however, is merely an accidental circumftance in plants, and cannot furnifh a true fpecific diftinction, becaufe fubject to variation. Thus a plant which would naturally be difpofed, in a proper foil, to produce feveral ftems, with difficulty produces one in a lean and poor earth: on the contrary, there are circumftances which promote the growth of feveral ftems from a fingle root, in plants which generally produce but one. *Vide Phil. Bot.* p. 216.

CESPITOSÆ *Paludes*, turf-bogs; a term of foil. *Vide* SOLUM.

CHARACTERES, marks or figns, characters. The defcription of the *Genera* of plants fo termed by Linnæus; hence the *Generical Character* of any plant, and the *Definition of the Genus*, are fynonimous terms.

The term *Character* is not extended by that author to the *fpecies* of plants; becaufe he never gives the complete defcription of any fpecies; but only enumerates thofe characters or circumftances in which it differs from all the other fpecies of the fame genus. This obfervation fufficiently illuftrates the different methods which are obferved in the *Genera* and *Species Plantarum*. In the former work, all the parts of the flower and fruit, from which the characters of the genera are derived, are accurately and completely def.ribed; in the latter, fuch ftriking circumftances only of the ftem, leaves, buds, roots, &c. are mentioned, as fufficiently diftinguifh the fpecies in queftion from every other of that genus to which it belongs.

The fame obfervation accounts for the appellations CHARACTERES and DIFFERENTIÆ, prefixed to two chapters or fections in the *Philofophia Botanica*: the former of which lays down rules for eftablifhing the genera; the latter, the fpecies.

In general, characters, or characteristical marks, according to the idea of systematic writers, are certain external signs obvious in the appearance of natural bodies, by means of which they are distinguished from one another. These signs being collected and expressed by proper words, lay the foundation at once for *definition*, *distribution*, and *denomination*, the three grand parts of practical botany.

The characters which are known by the sense of sight are only to be depended on in distinguishing bodies: those which are acquired by the other senses, as the taste and smell, being rarely or never to be admitted as marks of distinction.

The characteristic mark of each genus is to be fixed from the figure, situation, connection, number and proportion of all the parts.

Figure is the boundary of extension: in describing figure, therefore, let the boundaries be indicated by lines, and expressed by proper terms. For although, in ascertaining this property of bodies, accurate and geometrical dimensions cannot every where be obtained; yet is figure principally to be attended to in this view. Figures, from resemblance to other bodies, are fallacious, and should be but sparingly used. Tournefort and Linnæus are faulty in this respect. Instances of such improper terms, will occur frequently in describing the parts, particularly the trunk and leaf. *Vide* CAULIS and FOLIUM.

Situation, or insertion, (*situs*,) expresses an order of co-existing things, without any respect to their continuity or contiguity to others. Thus leaves are said to be opposite or alternate in point of situation; by which it is meant to express, not that the leaves are continuous or contiguous, for they are neither; but that they stand in a certain relation of opposition, or alternation to each other. The parts being accurately defined, excellent characters may be deduced from this property; as from the situation of the fins in fishes, and the various insertion of the stamina of flowers, into the calyx, petals, or receptacle.

Connection, (*nexus*,) expresses an order of co-existing bodies, respecting continuity and conjunction, by an immediate

diate production of the constituent parts. The coalescence of the parts is necessary in this property of bodies. The union of the claws with the upper spreading part of the petals; of the anthers and filaments of the stamina; and of the toes in web-footed birds, furnishes examples.

Number expresses unity multiplied, or the relation of similar parts to unity. Examples of characters thence deduced, are found in almost every part of natural history; thus the divisions of the calyx, petals, *stamina*, and *styli* in flowers; the feet, toes, wings, fins, and teeth in various animals; are, with respect to number, no despicable foundations of generic distinctions.

Proportion respects the comparison of quantities; or, to speak more accurately, the quantity of any part compared with another in its neighbourhood. In the vegetable kingdom, examples may be adduced from the proportion of the petals between themselves; from the segments, (*laciniæ*,) of the calyx, compared to those of the petals; from the stamina and petals, or stamina and styli: in the animal kingdom, from the proportion of the head and tail to the body, or of the wings and fins to one another.

Any part of a body considered either in itself, or with relation to others, is found to possess all the properties just enumerated. Characters, therefore, may be drawn from all the parts, to define the difference of bodies; thus the leaf, stem, flower and its parts in plants; the foot, wing, fin, in animals; all differ in their figure, situation, number, and proportion, and exhibit characters proper for distinction.

Experience shews that one part or property of a part varies more than another; in constituting a method, therefore, those parts and properties are to be selected, which vary least. Thus the parts of flowers in vegetables, the feet, fins, beaks, in animals, are more fixed with respect to the above-mentioned properties. Again, the figure and number of these parts are more apt to vary than their situation, connection and proportion; the characters, therefore, are, if possible, to be taken from these last.

In arranging natural bodies, nothing creates such confusion

ſion as the great variety which yet is ſo expreſſive of the Creator's omnipotence and wiſdom. The fact is, various bodies, every way limited in their eſſential properties, are ſubject to change from occaſional cauſes, in other properties leſs eſſential. Hence the enquirers into nature ſhould give particular attention to all the properties of bodies, and ſelect from them the moſt conſtant for ſcientific diſtinction.

The great number of bodies to be inveſtigated requires, that, in diſtinguiſhing them, we ſhould collect many characters; that from theſe placed in proper ſubordination, we may lay the foundation of the differences and agreements of bodies.

Before the invention of regular ſyſtematic methods, diſtinctive characters were derived from all the parts of plants indiſcriminately; a circumſtance which ſufficiently explains the confuſion that long obtained in botany, as well as the ſlow advances of the ſcience. It was not till the diſtribution into claſſes, genera and ſpecies became an object of attention, that rules were eſtabliſhed for fixing with preciſion the parts, whence characters could moſt commodiouſly be drawn.

Tournefort, who, in 1694, gave the firſt and moſt perfect model of this diſtribution, has made no diviſion of the characters in queſtion. Dr. Linnæus is the firſt who ſuggeſted four ſorts; the factitious, accidental, or artificial character, *character factitius*; the eſſential; the natural; and the habitual;—which are all equally applicable to the higher and lower diviſions.

Artificial Character.

The artificial character, otherwiſe called accidental, and by Linnæus, factitious, is drawn indiſcriminately from different parts of the plant, and admits of fewer or more characteriſtical marks than are abſolutely neceſſary for diſtinguiſhing the claſſes, genera, and ſpecies.

Linnæus, who particularly applies all the characters juſt enumerated, to the diſtribution of the genera, eſtabliſhes for

for a criterion of the artificial character, that it can never diftinguifh the genera in a natural order; being calculated merely for difcriminating fuch as arrange themfelves under the fame artificial order.

To the head of artificial characters is referred, by Linnæus the defcription of the genera, in the methods of Tournefort, Ray, Rivinus, Boerhaave, and moft of the other fyftematic botanifts.

The claffical characters only, in the fexual method, are deemed artificial: the generical, as exhaufting the defcription of the parts of fructification, its author confiders as true natural characters: with what propriety will be feen below.

Linnæus's idea of an artificial character is well expreffed by Ray, when he fays, That no more characteriftical marks of the genera are to be collected, than are found abfolutely neceffary for determining the genus with certainty and precifion.

Effential Character.

The effential character difcriminates one plant from another, by means of a fingle mark, fo ftriking and particular, as to diftinguifh the plant in which it is found, from every other at firft fight. It ferves, fays Linnæus, to diftinguifh fuch genera as arrange themfelves under the fame natural order.

The effential character of the claffes and genera, by the confent of all the modern fyftematic botanifts, ought to be drawn from one of the feven parts of fructification; that of the fpecies from any of the other parts, as the ftem, leaf, root, buds, &c. In the following fpecies of Linnæus, the effential fpecific characters are very improperly taken from the parts of fructification:

Tamarix floribus pentandris, tamarifk with five ftamina.
Tamarix floribus decandris, tamarifk with ten ftamina.
Spergula pentandra, fpurrey with five ftamina.
Salix floribus diandris, willow with two ftamina.
Salix triandra, willow with three ftamina.
Salix pentandra, willow with five ftamina.

 Valeriana

Valeriana floribus monandris, valerian with one ſtamen, or male organ.

Valeriana floribus diandris, valerian with two ſtamina.

Verbena diandra, vervain with two ſtamina.

Dryas pentapetala, dryas with five petals.

Dryas octopetala, dryas with eight petals.

Tilia floribus nectario inſtructis, lime-tree whoſe flowers are furniſhed with a *nectarium*. *Vide* NECTARIUM.

Tilia floribus nectario deſtitutis, lime-tree whoſe flowers want a *nectarium*.

Delphinium nectariis monophyllis, lark-ſpur with a *nectarium* of one leaf.

Delphinium nectariis diphyllis, lark-ſpur with a *nectarium* of two leaves.

Delphinium nectariis tetraphyllis, lark-ſpur with a *nectarium* compoſed of four leaves.

Papaveres capſulis hiſpidis, poppies with briſtly capſules, or ſeed-veſſels.

Papaveres capſulis glabris, poppies with ſmooth capſules.

Delphinium unicapſulare, lark-ſpur with one ſeed-veſſel.

Delphinium tricapſulare, lark-ſpur with three ſeed-veſſels.

Nigella pentagyna, fennel-flower with five ſtyles.

Nigella decagyna, fennel-flower with ten ſtyles.

Hypericum floribus pentagynis, trigynis, & digynis, St. John's-wort with five, three, and two ſtyles.

Beautiful as theſe ſpecific diſtinctions from the parts of the fructification frequently are, they muſt be allowed to be highly improper and immethodical; as, by making the ſame parts characteriſtical of the claſſes, genera and ſpecies, the illuſtrious author confounds the higher with the lower diviſions, and thus falls into the very error, which he himſelf has been at ſuch pains to expoſe.

In apology for ſo remarkable a deviation from his own principles, Linnæus tells us, that, though he once imagined, that, as the flower was of ſhort duration, and its parts commonly very minute, recourſe ſhould not be had to the fructification for ſpecific differences, till all other ways had been tried, and found ineffectual; yet, upon a ſtricter attention

tention to the ſubject, he was inclined to recant that opinion, as the fructification contains more diſtinct parts than all the reſt of the plant taken together; and certainty throughout nature, is found moſt commonly to obtain in her minuter parts. *Vide Phil. Bot.* p. 222.

I ſhall make no further comment upon this obſervation, than by remarking, that ſeveral of the ſpecies above enumerated, as well as many others in the Linnæan method of arrangement, might, with as great propriety, be denominated genera, and removed into different claſſes and orders, as many old genera, which were not eſtabliſhed on the fructification, are rejected by the ſexual ſyſtem, and converted into ſpecies.

The excellence of the eſſential character conſiſts in its brevity.

Natural Character.

This character includes the two former, and collects all the poſſible marks of plants. It is uſeful, ſays Linnæus, in every method; lays the foundation of the ſyſtems; remains unchanged, although new genera be daily diſcovered; and is capable of emendation by the detection of new ſpecies alone, which afford an opportunity of excluding ſuch characteriſtical marks as are totally ſuperfluous. He adds, that the *Genera Plantarum* firſt introduced theſe characters into the ſcience.

Botaniſts, from the time of Geſner, who eſtabliſhed the diſtribution into genera and ſpecies on rational principles, have been greatly puzzled in determining from what parts of the plant, claſſic, generic, and ſpecific characters might moſt commodiouſly be drawn.

Before we examine their opinions on this ſubject, it will not be improper to obſerve, that what they have ſaid of characters in general, may, with ſufficient propriety, be referred to the head of natural characters, which we are now conſidering.

Conrad Geſner, a phyſician of Switzerland, was the firſt, who, in 1560, ſuggeſted the idea of eſtabliſhing generic characters from the parts of the fructification; I mean, from the flower, fruit, and ſeed: a principle ſo much the more

 juſt,

juſt, as theſe parts being deſtined for the reproduction of the plant, muſt neceſſarily be moſt conſtant, and general. And yet, till the time of Geſner, the roots, leaves, or flowers alone had engaged the attention of enquirers into nature. In one of his letters to Zwinger, he thus expreſſes himſelf: "Ex his enim, (fructu, ſemine & flore) potius quam foliis, ſtirpium naturæ et cognationes apparent." And in another letter to Occon: "Meliſſa Conſtantinopolitana ad Lamium vel Urticam mortuam quodammodo videtur accedere; ſeminis tamen, unde ego cognationes ſtirpium indicare ſoleo, figura differt."

In 1694, Tournefort, who introduced into the ſcience order, purity, and preciſion, availed himſelf of Geſner's idea for eſtabliſhing the genera. Generical characters, according to this illuſtrious botaniſt, are to be drawn from all the parts of fructification, if neceſſary; if unneceſſary, from the moſt eſſential. If all the parts of fructification ſhould not ſufficiently diſtinguiſh any particular genus, recourſe is then to be had to auxiliary characters from the other parts of the plant, and even from their virtues and ſenſible qualities. The genera formed from the parts of fructification alone, were called primary genera, or genera of the firſt order; thoſe formed from any of the other parts combined with the fructification, were ſtyled ſubaltern genera, or genera of the ſecond order. See the article GENUS.

In ſhort, Tournefort, as well as Ray, proceeded upon this principle, neither to multiply characteriſtical marks without neceſſity; nor, on the other hand, to be ſo limited to a particular part of the plant, as at any time to incur the danger of ſacrificing accuracy to uniformity, or preciſion to elegance.

Heiſter, in a diſſertation *de Foliorum Utilitate*, printed at Helmſtadt, in 1731, is of opinion, that the leaves furniſh eſſential marks for characteriſing the genera of plants. Tournefort had advanced the ſame thing in the preface to his inſtitutions. His words are, "ſitus numeruſque foliorum plurimum faciunt ad generum diſtinctionem; ut fragariæ folia terna, &c." *Iſagoge*, p. 60.

In 1735, Dr. Linnæus, afterwards profeſſor of botany at Upſal,

Upſal, in Sweden, preferring uniformity to preciſion, proceeded to arrange the genera upon a new principle; and, notwithſtanding the lights which he muſt have received from the ingenious reſearches of Geſner, Ray, Tournefort, and other eminent botaniſts who preceded him, is not aſhamed to arrogate to himſelf the chief, nay, the ſole merit of eſtabliſhing the genera upon a ſure and unſhaken foundation.

The generical characters, according to Linnæus, are to be drawn from all the parts of the fructification, and in no caſe, be it ever ſo neceſſary, from any other. Upon this principle, ſo different from that of every former botaniſt, does the *Genera Plantarum* proceed: a book, which, although executed in a maſterly manner, and with the moſt aſtoniſhing accuracy, has, I think, contributed very little to the progreſs of the ſcience. This aſſertion will not appear extravagant, if it is conſidered that, accurately determined as the Linnæan Genera are, they have caſt a thick cloud over all the labours and ingenious enquiries of the very men to whom the ſcience is moſt indebted. The genera of Ray, Tournefort and Boerhaave, are now no more. Eſtabliſhed upon other principles, they are either ſwallowed up in more extenſive genera, and dwindle into mere ſpecies; or they are ſplit, and become numerous genera inſtead of one. The names too, are frequently changed, without neceſſity: in ſhort, ſuch is the transformation, that there are very few of the Linnæan genera which agree in every thing with correſponding genera in Tournefort, or Ray.

Linnæus calls his generic characters natural; and adds, that he was the firſt who introduced them into botany. "Ego primus, (ſays he) hos characteres compoſui;" again, "*Genera mea Plantarum* promunt characteres naturales." *Phil. Bot.* p. 130. And in the preface to his *Genera*, ſection 18, "Naturales itaque hic trado Characteres qui notas omnes in fructificatione obvias et communes exhibent; tales ante me, quantum novi, dedit nullus."

A character of this kind, continues the ſame author, is applicable to every method that has been, or ſhall be invented; and affords a foundation both to the old and new ſyſtems

 that

that are eſtabliſhed upon the parts of the fructification; viz. the calyx, petals, *ſtamina*, *piſtillum*, or fruit. The diſcovery even of a thouſand genera, does not render it neceſſary to make the ſlighteſt alteration in the next natural genus, by the addition or diminution of a ſingle character.

Theſe and many other properties of the natural character enumerated by Linnæus, are true. But was he the firſt that introduced this character into botany? I readily allow, that the principle of eſtabliſhing the genera from all the parts of the fructification, and none other, was never uniformly adopted by any former ſyſtematic writer. We have ſeen, however, that Ray and Tournefort, occaſionally adopted it; nay, never tranſgreſſed it, but with a view to avoid ſuperfluous characters, or imperfect deſcriptions. In fact, what has Linnæus added to Tournefort's generical characters of the paſſion-flower, burnet, the willow and poplar-trees, and many others, in which the latter has given accurate and full deſcriptions or figures of all the parts of fructification? It is true, he inſiſts leſs than Linnæus on certain parts, as the number of ſtamina in the above mentioned plants; the calyx and ſeeds in others: ſuch parts in his idea, being not only leſs eſſential, but even ſuperfluous for eſtabliſhing the character of the genus.

Nor is Tournefort the only botaniſt prior to Linnæus, whoſe generical characters exhauſt the deſcription of the parts of fructification. Many genera, in Boerhaave, are of the ſame kind.

Again, Linnæus's characters are by no means applicable to a natural method, which, in aſcertaining the genera of plants, is not confined merely to the parts of fructification. Thus in certain tribes or families, as the pea-bloom flowers, the leaves furniſh the moſt eſſential marks; and in others, as the gaping, or maſqued tribe, *ringentes*, the diſpoſition of the flowers. In fact, theſe characters cannot be applied to every artificial method, but to ſuch only as are eſtabliſhed on the parts of the flower and fruit; nor do I think that in theſe they are always ſufficient for aſcertaining the genus, without calling in ſome other characters to their aſſiſtance.

The natural character of the ſpecies of plants ought, according to Tournefort, to be drawn from all the parts which are unconnected with the fructification, as the root, ſtem, and leaves; likewiſe from their ſenſible qualities, as colour, taſte and ſmell.

To the former part of this aphoriſm Linnæus cheerfully ſubſcribes, but not to the latter. The duration of plants, their colour, place of growth, time of flowering, and other qualities which are not obvious in their appearance, are rejected by the ſexual ſyſtem as very improper ſpecific diſtinctions, and referred to the head of varieties, to which they more properly belong. If Linnæus has corrected one error in thus refuſing to admit the ſenſible qualities of plants into the number of genuine ſpecific diſtinctions, he has committed another no leſs dangerous, by having recourſe to characters from the parts of the fructification, which he adviſes to adopt, when they do not interfere with thoſe of the claſs and genus. Examples of this impropriety may be ſeen above.

Character drawn from the Habit or Port of Plants.

This character was the invention of the earlier botaniſts, who knew no better rule for the diſtribution of vegetables. It is drawn from the external face or general conformation of plants, conſidered with reſpect to the reſult of all their parts, their manner of growth, the diſpoſition of the branches and leaves; in ſhort, all the relations which approximate plants, or remove them from one another.

The character of the habit, although quickly diſcerned, and eaſily recalled by the memory, has never been employed but in diſtinguiſhing the ſpecies. Linnæus ſeems to think, that it may be uſed, with caution, and in default of other characters, for aſcertaining the genera; and M. Gouan, in his *Hortus Monſpelienſis*, has uſefully adopted it under the name of ſecondary character.

As among quadrupeds, ferocious animals, ſuch as the bear, and lion, are diſtinguiſhed at firſt ſight, from the ſheep, bull, camel, and other *pecora*, without inſpecting their teeth by

by which they are artificially arranged: ſo many natural orders of plants may be diſtinguiſhed from one another by their habit or external face, without having recourſe to any artificial or partial characters whatever.

An expert botaniſt, ſays Linnæus, can eaſily diſtinguiſh the plants of Africa, Aſia, America, and the Alps, from each other, by their habit and external face, without being able to aſſign the cauſes or characteriſtic marks of ſuch diſtinction. Thus the plants of Africa have a certain ſtern, dry, obſcure appearance; thoſe of Aſia are proud and towering; the American plants have a ſmooth agreeable aſpect; thoſe of the Alps appear hardy and vigorous.

From what has been ſaid of claſſic, generic, and ſpecific characters, they appear to be highly arbitrary and variable. So far, indeed, from being fixed on an unſhaken foundation, they are ſubjected to the caprice of every ſyſtematic botaniſt, who may regard as accidental, or arbitrary, what others conſider as true, natural and eſſential characters.

I conclude with laying down Linnæus's arbitrary principles on this head. Theſe eſtabliſh that the characters of the claſs are to be taken from one part of the fructification: thoſe of the genus, which he calls his natural characters, from all the parts of the fructification, and none other: thoſe of the ſpecies, from all the other parts, as the root, trunk, leaf, buds, and habit; nay, even from ſome circumſtances attending the parts of fructification, if they do not enter into the character of the genus or claſs.

CHRONICI, from χρονος, time. By this name Linnæus denominates a claſs of early botaniſts, who arranged all plants from their time of flowering.

CICHORACEUS *Flos*, from *cichorium*, ſuccory; a flower like ſuccory, or endive. The term is uſed by Vaillant, and is ſynonimous to the *planipetalus* of Ray and Boerhaave, the *ſemifloſculoſus* of Tournefort, the *lingulatus* of Pontedera, and the *ligulatus* of Linnæus. *Vide* LIGULATUS, *&c.*

CICHORACEI, the name of a claſs in Cæſalpinus's ſyſtem, and of Vaillant's arrangement of the compound flowers, conſiſting

confiſting of plants whoſe flowers, like endive, are compoſed of ſeveral leſſer flowers, which are hollow at the baſe only, flat in the middle, and expanded towards the top. Of this ſort are dandelion, hawk-weed, nipple-wort, viper's-graſs, and ſeveral others.

CIRCULATIO *humorum ſeu ſucci.* Circulation of the humours, or ſap in plants.

The curious controverſy in philoſophical botany, reſpecting the deſcent of the ſap, is fully diſcuſſed under the article SUCCUS, which ſee.

CIRRUS, (*capillus quaſi in circum tortus*,—curled or frizzled hair,)—a claſper, or tendril; that fine ſpiral ſtring or fibre, put out from the foot-ſtalks, by which ſome plants, as the ivy and vine, faſten themſelves to walls, pales, or trees for ſupport.

The term is ſynonimous to the *capreolus*, *clavicula*, and *viticulus* of other botaniſts, and is ranked by Linnæus among the *fulcra*, or parts of plants that ſerve for ſupport, protection, and defence. *Vide* FULCRA.

Tendrils are ſometimes placed oppoſite to the leaves, as in the vine; ſometimes at the ſide of the foot-ſtalk of the leaf, as in paſſion-flower; and ſometimes, as in the winged-pea, *piſum ochrus*, they are emitted from the leaves themſelves.

With reſpect to compoſition, they are either ſimple, that is, compoſed of one fibre or chord, as in the vetch; or compound, that is, conſiſt of two, three, or more, as in the everlaſting pea.

Bitter-ſweet, *ſolanum dulcamara*; *bignonia*, and ivy, ſend forth tendrils which plant themſelves like roots in the adjacent walls, or the bark of the neighbouring trees.

Claſpers, ſays the ingenious Dr. Grew, are not like trunk roots, a mean betwixt a root and a trunk, but a compound of both, as may be gathered from their circumvolutions, in which they mutually aſcend and deſcend.—In the mounting of the trunk, continues the ſame author, claſpers ſerve for ſupport. Thus in vines, the branches being very long, fragile and ſlender, would be liable to frequent breaking, unleſs, by means of their claſpers, they were mutually con-

tained

tained together; ſo that the whole care is divided betwixt the gardener and Nature: the former, with his ligaments of leather, ſecures the main branches; and Nature, with thoſe of her own providing, ſecures the leſs. Their aptitude to this end is ſeen in their convolutions, a motion not proper to any other part: and alſo in their toughneſs, which is ſo much the more remarkable, as they are ſlenderer than the branches from which they proceed.—In the trailing of the trunk, tendrils ſerve for ſtabiliment and ſhade. Thus in cucumbers, the trunk and branches being long and fragile, would be driven to and fro by the winds, to the great prejudice both of themſelves and their tender fruits, were they not by theſe ligaments held faſt together, and preſerved in good aſſociation and fellowſhip. The ſame claſpers ſerve likewiſe for ſhade: ſo that a natural arbour is formed by the branches of the cucumber, in the ſame manner as an artificial one is made by tangling together the twigs of trees; for the branches, by the linking of their claſpers, being couched together, the tender fruits lie under the umbrage of a bower made of their own leaves.

Moſt of the pea-bloom flowers have twining claſpers, that is, which wind to the right and back again.

CLASSIS, a claſs; the firſt and higheſt diviſion in every method; defined by Tournefort to be a collection of *Genera* which have ſome ſtriking mark in common; and by Linnæus, the agreement of ſeveral *Genera* in the parts of the fructification, according to the principles of nature, diſtinguiſhed by art. This primary diviſion is very aptly illuſtrated by the manner in which a dictionary is compiled; there all the words, which have the ſame initial letter, arrange themſelves together, as it were, under one claſs: each particular word being a diſtinct genus of that claſs. The claſſic character then is conſtituted from a ſingle circumſtance, as the initial letter in queſtion which is found to be poſſeſſed equally by all the words in that diviſion, how different ſoever they are in other reſpects.

The ancient botaniſts knew neither methods, ſyſtems, nor claſſes; they collected in chapters, or in ſections, thoſe plants,

plants, which appeared to them to reſemble each other in the greateſt number of relations. It is in this manner that Theophraſtus, Dioſcorides, and other authors, who are conſidered as ſyſtematic botaniſts, have arranged vegetables.

The ſingle mark which characterizes the claſs is arbitrary; and therefore different in different ſyſtems. In Tournefort, the petals; in Ray, the fruit; and in Linnæus, the ſtamina, furniſh claſſic artificial characters.

Claſſes are ſubdivided into ſections or orders, and diſtinguiſhed, like ſyſtems, into natural and artificial. The umbelliferous, compound, pea-bloom, and croſs-ſhaped flowers ſeem to prove that there are true natural claſſes. *Vide Phil. Bot.* p. 100.

Some artificial methods retain a few of the natural claſſes; others preſerve none. In general, that method is to be preferred, which collects the greateſt number of ſuch claſſes. Whenever a claſs, or part of a method, is demonſtrated to be falſe, that method cannot be natural; it is artificial.

Modern botaniſts having eſtabliſhed as an axiom, that the characters of the claſs may be drawn from any of the parts of fructification, were determined in their choice by the real, or ſuppoſed conſtancy of a particular part. Thus Tournefort's ſyſtem, as we have ſaid, is founded upon the ſtructure, figure, and other circumſtances of the petals: that of Magnolius, on the calyx; thoſe of Ray and Boerhaave, on the fruit; that of Sigeſbeck, on the ſeeds; and that of Linnæus, upon the ſtamina. The piſtil, although as uniform and conſtant as any of the other parts, has never yet been employed as a claſſic diſtinction: Linnæus chiefly uſes it as the foundation of his ſecondary diviſions or orders, as Tournefort does the fruit, becauſe it generally ſucceeds the petals, which furniſh his claſſic characters.

Tournefort was the firſt who demonſtrated that the parts of the fructification in plants were preferable to all the other parts for eſtabliſhing the claſſes. Theſe laſt, however, he does not abſolutely exclude: on the contrary, he admits them, whenever the other characters are inſufficient. Linnæus has followed Tournefort's principle in all its rigour,

and pretends that the claſſic characters ought to be taken from the parts of fructification, and none other.

From this diverſity of opinion, with reſpect to the moſt eſſential parts of the plant, or of the fructification, for eſtabliſhing a ſyſtem, have ariſen the diſſenſions among ſyſtematic writers, who, miſunderſtanding the extent of the principle in queſtion, have framed a multiplicity of methods, each of which is regarded by its founder, as the moſt univerſal, moſt eaſy, and moſt natural that had hitherto appeared. But how can thoſe methods be natural, which contain few or no natural claſſes? Or how can the principles upon which ſuch claſſes proceed, be regarded in any other light than as arbitrary and hypothetic?

The excellence, or defect, of the claſſic character conſiſts, ſays Linnæus, in its greater or leſs approximation to the natural one. Natural claſſes are ſuch as agree in their habit, manner of growth, virtues, uſes and ſenſible qualities. Such are the graſſes, the compound, umbelliferous, pea-bloom, croſs-ſhaped, and verticillated flowers, the ferns, and ſome others.

CLAVICULA, (diminutive from *clavis*, a key; uſed by Cicero for the tendril of a vine, wherewith it takes hold of any ſubſtance, and climbs up by it,)—a claſper, or tendril. The term is employed by Tournefort, Ludwig, and the ancient botaniſts. Linnæus has ſubſtituted CIRRUS, which ſee.

CLAVUS, (properly a nail,—uſed by Celſus for any horny appearance, as a corn in the toe or elſewhere—,) a ſpecies of diſeaſe, to which the grains of many graſſes, particularly thoſe of rye, are incident. *Vide* VARIETAS.

CLIMA, a climate; a part of the ſurface of the earth, bounded by two circles parallel to the equator.

Different climates, as well as different ſoils, rarely produce plants of the ſame ſpecies. This ſubject is curious, and, conſidering its importance to gardening, well deſerves the attention of every botaniſt.

The numerous ſpecies of plants, which grow betwixt the North Pole and the Equator, when viewed in detail, appear

to differ from each other only by infenfible degrees: yet are the plants of the frozen zones, when viewed *in cumulo*, totally different from thofe which are produced betwixt the tropics. Thus we often fee whole families of plants natives of the torrid zone, which are never to be found in any of the others.

In the climate of plants, fays Linnæus, are to be confidered latitude, longitude, and the temperature or elevation of the foil. Vaillant was among the firft who viewed the loca natalia of plants in this light; but his obfervations were confined to latitude alone.

Places fituated under the fame parallel of latitude, but in oppofite hemifpheres, produce plants that are totally different; even thofe in the fame hemifphere are rarely alike. Thus Rome, Pekin, and New York in America, are fituated almoft in the fame degree of north latitude, yet produce very different plants. The fame may be faid of the plants of Florida and Paleftine, the Cape of Good Hope, and Chili in South-America: places which exactly correfpond in latitude; the two former fituated in the northern hemifphere; the latter in the fouthern.

What has been affirmed of latitude, may likewife be afferted of places that are fituated upon the fame meridian. Thus the North Cape, Rome, Upfal, and the Cape of Good Hope, agree in longitude, yet produce plants that are totally different.

The aptitude, however, of plants to grow in certain climates, and not in others, feems to depend not fo much upon longitude and latitude, as upon the elevation of the foil, or difference of temperature in fuch climates. From this caufe principally proceeds the difference which is generally found to obtain betwixt the plants of the torrid, and thofe of the temperate and frigid zones. For when in the torrid zone we find mountains, which, by their elevation, have acquired a temperature fimilar to that of the temperate or frigid zones, we always difcover on fuch mountains the fame, or, at leaft, a part of the fame, plants. Thus the plants on the mountains of Lapland, of Switzerland, Greenland, Siberia, Wales, the

the Pyreneans, Olympus, Ararat, the Andes, and thoſe of Braſil, though placed at ſuch immenſe diſtances from each other, are nearly the ſame.

Again, as at a certain depth, the temperature of water is found to be nearly the ſame in all climates: the greateſt part of aquatic plants are common to the torrid, temperate and frigid zones. Thus the water-lily, *aldrovanda*, ſun-dew, arrow-head, water-milfoil, and many other aquatics, are equally natives of Europe and the Indies.

As culture, ſo climate, has a mighty tendency to change the texture and external appearance of plants. Thus the ſame plants which, under an inclement, rigorous atmoſphere, are covered, or cruſted over with a thick coriaceous ſkin, ſhall, in more indulgent ſkies, exhibit no ſuch appearance, but be perfectly ſmooth.

COADUNATÆ, (*coadunare*, to join, or gather together). The 52d order of plants, in Linnæus's Fragments of a Natural Method, ſo termed, as I imagine, from the general appearance of the ſeed-veſſels, which are numerous, and being ſlightly attached below, form altogether a ſingle fruit in the ſhape of a ſphere or cone, the parts of which, however, are eaſily ſeparated from one another.

The Genera *contained in this Order are ſix:* viz.

Linnæan Genera.	*Engliſh Names.*
Annona.	
Liriodendron, —	— The Tulip Tree.
Magnolia, —	— Laurel-leaved Tulip Tree.
Michelia.	
Uvaria.	
Xylopia.	

Habit and Structure of the Plants of this Order.

This family of exotic plants furniſhes as beautiful and choice a collection of ſhrubs and trees, both evergreen and deciduous, as is to be found in the whole vegetable kingdom. The trees are often ſixty feet high, and garniſhed from the bottom

bottom to the top with ſpreading branches and leaves of a bright green colour, which aſſume a very agreeable conic form.

The Roots are branched and fibrous.

The Stems cylindric.

The Wood very hard.

The Buds conic, flat, and generally naked, or without ſcales.

The Leaves are univerſally ſimple, and alternate. The foot-ſtalk is cylindric, without furrows, frequently ſwelled at its origin, and appears jointed at its inſertion into the branch.

In the magnolias, and tulip-trees, two very large *ſtipulæ*, or ſcales, are attached to the branches near the origin of the foot-ſtalk of the leaves; but theſe fall ſoon after the leaves are expanded. *Vide* Stipula.

The Flowers are hermaphrodite, that is, have both *ſtamina* and piſtil within the ſame covers; and are generally produced either along, or at the end of, the branches.

The Calyx generally conſiſts of three oblong plain leaves like petals, which fall off with the flower. The tulip-tree, beſides a flower-cup of three leaves, has likewiſe an external *involucrum*, or cover, compoſed of two triangular leaves, which fall away in like manner as the others.

In *xylopia*, the calyx conſiſts of one leaf; in *uvaria*, it is permanent, that is, accompanies the ſeed-bud to its maturity.

The Petals are in number, from ſix to eighteen, oblong, concave, and frequently diſpoſed in two or three ſeries or rows, the outermoſt of which are largeſt.

The Stamina are numerous, ſhort, and inſerted into the common receptacle in the five firſt genera; into the *germen*, or ſeed-bud, in the ſixth; a circumſtance, which removes that genus to the claſs *Gynandria* in the ſexual method; whilſt the other genera, from the indefinite number of their *ſtamina*, are reduced to the claſs *polyandria* in the ſame method. *Vide* Gynandria, and Polyandria.

The Filaments, or threads of the ſtamina, are very

ſhort and ſlender; *uvaria*, *xylopia*, and the cuſtard-apple, have ſcarce any filaments at all.

The ANTHERS, or tops, are numerous, ſlender, and placed round the ſeed-bud; in *xylopia*, they are ſeated upon it.

The PISTIL, or pointal, generally conſiſts of a number of ſeed-buds, diſpoſed in the form of a cone, and ſeated upon a receptacle, which riſes like a ſmall pillar above the receptacle of the calyx. Cuſtard-apple, and *xylopia*, have only one roundiſh ſeed-bud.

From each ſeed-bud generally ariſes a cylindric ſtyle, which is very ſhort, and in *magnolia* bent backwards.

The tulip-tree, *michelia*, and the cuſtard-apple, have no ſtyle.

In *xylopia* it is of the length of the petals.

The STIGMA, or top of the ſtyle, is commonly blunt, and in *michelia*, bent backwards.

Magnolia has a hairy ſtigma placed along each ſtyle.

The SEED-VESSEL is commonly a berry; in *magnolia* it is an oval cone, conſiſting of a number of roundiſh capſules, laid over one another like tiles. The fruits, or ſeed-veſſels, whether of the berry, capſule, or cherry kind, are equal in number to the ſeed-buds, and generally ſlightly attached below.

In the tulip-tree there is properly no ſeed-veſſel; the ſeed-buds, in the progreſs of vegetation, become ſo many naked ſeeds, which lie over one another like the ſcales of fiſh, and form the appearance of a cone.

The SEEDS, in this order, are generally numerous, hard, roundiſh, and ſometimes cornered. In the *magnolias*, each capſule contains a ſingle kidney-ſhaped ſeed, of the nature of a berry, which, when ripe, is diſcharged from its cell, and hangs by a ſlender filament, or thread.

In *xylopia*, the ſeed is a ſtone, the fruit being of the cherry kind.

The ſeeds of the tulip-tree are winged. *Vide* ALA.

The plants of this order have a ſtrong, agreeable, and aromatic ſmell; the fruits and ſeeds have a pungent taſte, like pepper. The bark and wood are bitter.

The berries are efculent, particularly thofe of *annona*, fome fpecies of which have an exquifite and very delicate tafte.

None of thefe plants, as far I can learn, (four-fop, a fpecies of *annona* excepted,) have ever been ufed in medicine; but for beauty and ornament, they yield to no tribe or family whatever, on which account they have of late years been cultivated with great care in this country.

The talleft *magnolia* is a native of Florida, and South-Carolina, where it rifes to the height of eighty feet, and upwards, with a ftrait trunk of two feet diameter, and a regular head; the leaves refemble thofe of the common laurel, but are much larger; they are of a fhining green on their upper furface; of a ruffet, or buff-colour on their under, and continue all the year: fo that this is one of the moft beautiful ever-green trees yet known.

The leaves of the *magnolia tripetala* are very large, and produced in horizontal circles fomewhat refembling an umbrella; from which circumftance, the inhabitants of Virginia and Carolina, where it grows naturally, have given it the name of umbrella-tree.

The tulip-tree, termed by Linnæus *liriodendron*, from the fancied refemblance of its flowers to thofe of the lily, and by other botanifts, *Tulipifera*; is a native of North-America, where it grows to be a tree of the firft magnitude, and is generally known through all the Englifh fettlements by the title of poplar. Of late years, a great number of thefe trees have been raifed from feeds in the Englifh gardens; fo that they are now become common in the nurferies about London. The firft of the kind which flowered in England, was in the gardens of the late earl of Peterborough, at Parfon's-Green, near Fulham. There is a very beautiful tulip-tree which flowered laft fummer, (1769)* in the garden of Waltham-Abbey; and at Wilton, the feat of the earl of Pembroke, there are fome trees of great bulk. The flowers, which are produced at the end of the branches, confift of fix petals, in two rows, which form a fort of bell-fhaped

* The firft edition of the Botanical Dictionary was publifhed in 1770.

 flower,

flower, whence the North Americans gave it the name of tulip.

Some of thefe trees, fays Catefby, in his Natural Hiftory of Carolina, are thirty feet in circumference, with unequal and irregular boughs, which diftinguifh them at a diftance, even when they are ftript of their leaves. Their timber is of great ufe in their native foil, particularly for making that kind of boats called periaugues.

The cuftard-apple, a fpecies of *annona*, derives its name from the texture of the fruit, which, when ripe, is of an orange colour, with a foft, fweet, yellowifh pulp, of the confiftence of a cuftard.

North American *annona*, is called by the inhabitants papaw-tree.

The fruit of Soortfak, Zuurfak, or four-fop, the *annona muricata* of Linnæus, is fhaped like a heart, but fomewhat longer, and generally bends towards the point. The out-fide is of a glaucous green, ftudded here and there with foft-pointed prickles. The infide is a foft pulpy fubftance, which is eaten, and looked upon to be a good cooler in fevers.

The leaves of moft fpecies of *annona* being rubbed, emit a ftrong agreeable fcent.

COLOR, colour; an attribute, or fenfible quality, which, in plants, is found to vary, not only in different individuals of the fame fpecies, but likewife in different parts of the fame individual. Thus marvel of Peru, and fweet-william, have frequently petals of a different colour, on the fame plant.

Three or four different colours are frequently found upon the fame leaf, or flower: as on the leaves of the *amaranthus tricolor*, and the flowers of the tulip, auricula, three coloured violet, and others. To produce the moft beautiful, and ftriking variety of colours in fuch flowers, is the principal delight and bufinefs of the florift.

The primitive colours, and their intermediate fhades or gradations, enumerated by botanifts, are as follows.

Water-colour, *hyalinus*.

WHITE, *albus*.

Lead-

Lead-colour, *cinereus*.
BLACK, *niger*.
Brown, *fuſcus*.
Pitch-black, *ater*.
YELLOW, *luteus*.
Straw-colour, *flavus*.
Flame-colour, *fulvus*.
Iron-colour, *gilvus*.
RED, *ruber*.
Fleſh-colour, *incarnatus*.
Scarlet, *coccineus*.
PURPLE, *purpureus*.
Violet-colour, *cæruleo-purpureus*.
BLUE, *cæruleus*.
GREEN, *viridis*.

Theſe colours ſeem to be appropriated to particular parts of the plant. Thus white is moſt common in roots, ſweet berries, and the petals of ſpring flowers. Water colour, in the filaments and ſtyles. Black, in the root and ſeeds; rarely in the ſeed-veſſel, and ſcarce ever to be found in the petals. Yellow is frequent in the anthers, or tops of the ſtamina; as likewiſe in the petals of autumnal flowers, and the compound ligulated flowers of Linnæus. *Vide* LIGULATUS *Flos*.

Red is common in the petals of ſummer-flowers, and in the acid fruits. Blue and violet colour, in the petals. Green, in the leaves and calyx, but rarely in the petals.

In the interchanging of colours, which in plants is found to depend upon differences in heat, climate, ſoil and culture, a ſort of elective attraction is obſerved to take place. Thus red is more eaſily changed into white and blue; blue into white and yellow; yellow into white; and white into purple.

A red colour is often changed into a white, in the flowers of heath, mother of thyme, betony, pink, viſcous campion, *cucubalus*, trefoil, orchis, fox-glove, thiſtle, cudweed, ſaw-wort, roſe, poppy, fumatory, and geranium.

Red paſſes into blue in pimpernel.

Blue is changed into white in bell-flower, Greek valerian, bind-weed, columbine, violet, vetch, milk-wort, goat's-rue, viper's-buglofs, comfrey, borage, hyffop, dragon's-head, fcabious, blue-bottle and fuccory.

Blue is changed into yellow in crocus.

Yellow paffes eafily into white in melilot, agrimony, mullein, tulip, *blattaria*, or moth-mullein, and corn marigold.

White is changed into purple in wood-forrel, thorn-apple, peafe, and daify.

Although plants are fometimes obferved to change their colour upon being moiftened with coloured juices, yet that quality in vegetables feems not fo much owing to the nature of their nourifhment, as to the action of the internal and external air, heat, light, and the primitive organization of the parts.

In fupport of this opinion, we may obferve with Dr. Grew, that there is a far lefs variety in the colours of roots, than of the other parts of the plant; the pulp, within the fkin, being ufually white, fometimes yellow, rarely red.

That this effect is produced by their fmall intercourfe with the external air, appears from this circumftance, that the upper parts of roots, when they happen to ftand naked above the ground, are often dyed with feveral colours: thus the tops of forrel roots turn red; thofe of turnips, mullein, and radifhes, purple; and many others green: whilft thofe parts of the fame roots, which lie more under ground, are commonly white.

The green colour is fo proper to leaves, that many, as thofe of fage, the young fprouts of St. John's-wort, and others which are reddifh when in the bud, acquire a perfect green, upon being fully expanded.

In like manner, the leaves of the fea-fide grape, *polygonum*, which, when young, are entirely red, become, as they advance in growth, perfectly green, except the middle and tranfverfe ribs, which retain their former colour.

As flowers gradually open, and are expofed to the air, they throw off their old colour, and acquire a new one. In fact, no flower has its proper colour till it is fully expanded. Thus the purple ftock gilly flowers are white, or pale, in the bud.

bud. In like manner, batchelor's-buttons, blue-bottle, poppy, red-daisy, and many other flowers, though of divers colours when blown, are all white in the bud. Nay, many flowers change their colours thrice successively; thus the very young buds of lady's looking-glass, buglofs, and the like, are all white; the larger buds purple, or murrey; and the open flowers, blue.

With respect to the colours of the juices of plants, we may observe that most resinous gums are tinctured; some, however, are limpid; that which drops from the domestic pine, is clear as rock-water. The milk of some plants is pale, as in burdock; of others, white, as in dandelion, euphorbium, and scorzonera; and of others yellow, as in lovage, and greater celandine. Most mucilages have little colour, taste, or smell.

Of all the colours above enumerated, green is the most common to plants, black the most rare.

Most plants, either by decoction, or long infusion, communicate a green colour to oil. Saffron gives it a light golden tincture.

Several aromatic plants, as mint, marjoram, balm, being dried and infused in oil, give it a double tincture, both green and yellow; one drop of the oil shewing green; but a good quantity of it held up against a candle, looks reddish, or of a deep yellow colour.

Alkanet root, the *anchusa minor purpurea* of Parkinson, is the only vegetable yet known, which gives a true red tincture to oil; yet will it not colour water in the least.

Red roses being dried, and infused for some time in oil of aniseed, a more potent menstruum than common oil, lose their own colour entirely, and turn white, without effecting any change on the oil, which remains limpid as at first.

As oil rarely takes a red, there being but one known instance of it; so there is no plant that I know of, which, by infusion, will give a perfect green to water.

But although the green leaves will not give their visible colour, by infusion in water, yet will they impart most other colours, as well as the flowers themselves. Thus the leaves of

of cinquefoil give a tincture resembling Rhenish wine; those of hyssop, Canary; of strawberry, Malaga; of mint, Muscadine; those of wood-sorrel produce a tincture resembling a mixture of Claret and water; of balm, near as red as ordinary Claret alone. All aromatic hot plants give a yellow-red tincture to water, as well as oil. These leaves, however, do not all give their tincture in the same space of time; some require a fortnight; others a week; others five, three, or two days; and some but one, or even half a day.

Spirit of wine is as unsusceptible of a blue colour, as the two former menstrua are of a red and a green. In fact, several blue flowers, as lark-heel, violet, mallows, borage, being infused in that spirit, produce no sensible effect in changing its colour: yet upon dropping a little spirit of sulphur, or sal-ammoniac, into the infusion, it immediately becomes a full red in the first case; a deep green in the other:—the precise effects which these substances would have produced, if the liquor had been previously of a blue colour.

Balm, the green leaves of which, as we observed above, give a Claret colour to water, gives a pure and perfect green to spirit of wine.

Yellow and red flowers give a stronger and fuller tincture to water than to spirit of wine; as may be seen by comparing the infusions of cowslips, poppies, clove gilly-flowers, and roses, in either liquor.

Let us now examine what changes are effected in colour, by the mixture of the infusions of plants with other bodies.

A strong infusion, or the juice, of the leaves of rose-tree, raspberry, strawberry, cinquefoil, gooseberry, primrose, Jerusalem-cowslip, peony, bistort, laurel, and goat's-beard, dropped upon steel, makes a purple tincture.

Sugar of lead dropped on a tincture of red roses, turns it to a faint pale green.

Salt of tartar dropped upon the same tincture, turns it to a deeper green.

Spirit of sulphur dropped on the green leaves of Adonis flower, everlasting-pea, and hollyhock, turns them all yellow.

Salt

Salt of tartar dropped on the whiteflowers of daisy, changes them into a light green.

Of all colours, yellow seems to be the most fixed and unfading. No sensible change is effected by dropping the spirit of sulphur, or a solution of tartar, on a tincture of the yellow flowers of crowfoot, adonis, and saffron.

Of all water-colours, the rarest and most difficult to make clear, bright, and permanent, is blue. There are many flowers of an excellent blue colour, as those of the buglofs, lark-heel, and others; but they easily fade. Among the very few instances of flowers that will strike into a blue, may be mentioned lathyrus, or the everlasting pea, which, upon the affusion of spirit of hartshorn, is changed from a peach to a pure blue. Other alkalis, and particularly lime-water, will, no doubt, have the same effect, and perhaps, render the colour more permanent.

For a full discussion of this curious subject the reader is referred to a very ingenious treatise of the learned Dr. Grew on the Colours of Plants, read before the Royal Society, from which many of the above observations and experiments are taken.

We proceed to make some further remarks on the colours of plants, with reference to method and systematic arrangement.

Colour being, as we have seen, so very susceptible of change, ought never to be employed in distinguishing the different species of plants, which are to be characterized from circumstances not liable to alteration by culture, or other accidents.

Hitherto we have treated principally of the inconstancy of colour in flowers, as the tulip, hyacinth, anemone, ranunculus, primrose, blue-bottle, bell-flower, columbine, violet, fumatory, and many others.

The same inconstancy is observed in other parts of the plant; berries frequently change from green to red, and from red to white. Even in ripe fruits, the colour, whether white, red or blue, is apt to vary; particularly in apple, pear, plumb, and cherry-trees.

Seeds

Seeds are more conftant in point of colour, than the veffel which contains them. In the feeds, however, of the poppy, oat, pea, bean, and kidney-bean, variations are frequently obferved.

The root too, although not remarkably fubject to change, is found to vary in fome fpecies of carrot and raddifh.

Leaves frequently become fpotted, as in a fpecies of orchis, hawk-weed, ranunculus, knot-grafs, and lettuce; but feldom relinquifh their green colour altogether. Thofe of fome fpecies of amaranthus, or flower-gentle, are beautifully coloured.

The fpots that appear on the furface of leaves, are of different colours, liable to vary, and not feldom difappear altogether.

The leaves of officinal lungwort, and fome fpecies of fowbread, forrel, trefoil, and ranunculus, are covered with white fpots. Thofe of dog's-tooth violet, with purple and white.

Thofe of feveral fpecies of ranunculus, and orchis, and a kind of knot-grafs, called by Tournefort, *Perficaria ferrum equinum referens*, with black and purple.

Thofe of *Amaranthus tricolor*, with green, red, and yellow.

Thofe of *Ranunculus acris*, and a fpecies of bog-bean, with red, or purple.

The under furface of the leaves of fome fpecies of pimpernel, and of fea plantain, is marked with a number of dots, or points. A white line runs through the leaves of Indian-reed, black-berried heath, and a fpecies of canary-grafs; and the margin, or brim of the leaf, in fome fpecies of box, honey-fuckle, ground-ivy, and the ever-green oak, is of a filver-white colour.

The whole plant is often found to affume a colour that is unnatural, or foreign to it. The varieties in fome fpecies of eryngo, mugwort, orach, amaranthus, purflane, and lettuce, furnifh examples.

Such being the inconftancy of colour in all the parts of the plant, fpecific names derived from that quality are, very properly, by Linnæus, deemed erroneous; whether they

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refpect the colour of the flower, fruit, feeds, root, leaves; or exprefs in general, the beauty or deformity of the entire plant, with a particular view to that circumftance. Of this impropriety, fo generally committed by former botanifts, Linnæus himfelf is not always guiltlefs. Thus the two fpecies of *farracenia*, or the fide-faddle flower, are diftinguifhed by the colour of their petals into the yellow and purple farracenia; although the fhape and figure of the leaves afforded much more conftant, as well as ftriking, characters. The fame may be faid of his *lupinus albus, & luteus*; *Refeda alba, glauca, & lutea*; *Angelica atropurpurea*; *Dictamnus albus*; *Lamium album*; *Selago coccinea*; *Sida alba*; *Paffiflora rubra, lutea, incarnata, & cærulea*; and of many others, in which the fpecific name is derived from a character or quality that is fo liable to vary in the fame fpecies. I conclude this article with obferving, that of all the fenfible qualities, colour is leaft ufeful in indicating the virtues and powers of vegetables. The following general pofitions on this fubject, are laid down by Linnæus, and feem fufficiently confirmed by experiment.

A yellow colour generally indicates a bitter tafte; as in gentian, aloe, celandine, turmeric, and other yellow flowers.

Red indicates an acid, or four tafte; as in cranberries, berberries, currants, rafpberries, mulberries, cherries; the fruit of the rofe, fea-buck-thorn, and fervice-tree. Herbs that turn red towards autumn, have likewife a four-tafte, as forrel, wood-forrel, and bloody dock.

Green indicates a crude alkaline tafte, as in leaves and unripe fruits.

A pale colour denotes an infipid tafte, as in endive, afparagus, and lettuce.

White promifes a fweet, lufcious tafte; as in white currants, and plumbs, fweet apples, &c.

Laftly, black indicates a harfh, naufeous, difagreeable tafte; as in the berries of deadly night-fhade, myrtle-leaved fumach, herb-chriftopher, and others; many of which are not only unpleafant to the tafte, but pernicious, and deadly in their effects,

To

To difcover the acid, or alkaline quality of any plant, exprefs fome of the juice, and rub it upon a piece of blue paper, which, if the plant in queftion is of an acid nature, will turn red; if of an alkaline, green.

COLUMELLA, (*quafi Columnella*, a little pillar, or column.) The fubftance which paffes through that fpecies of feed-veffel called a capfule, and connects the feveral internal partitions with the feed. *Vide* CAPSULA.

COLUMNIFERÆ, from *columna*, a pillar; and *fero*, to bear. The name of the 37th order in Linnæus's Fragments of a Natural Method, confifting of plants whofe ftamina and piftil have the appearance of a pillar in the centre of the flower.

Lift of the Genera *contained in this Natural Order.*

SECTION I.

Plants with Stamina that are diftinct, and inferted into the common Receptacle.

Linnæan Genera.		English Names.
Bixa,	— —	Arnotta, or Anotta; by the French termed Roucou.
Corchorus,	— —	Jew's-Mallow.
Heliocarpus,	— —	Tree Montia.
Kiggelaria.		
Microcos.		
Muntingia.		
Thea,	— —	Tea-Tree.
Tilia,	— —	Lime, or Linden-Tree.
Turnera.		
Triumfetta.		

SECTION II.

Plants with Stamina that are diftinct, and inferted into the Piftillum, *or Pointal.* (Gynandria.)

Ayenia.
Grewia.

Helicteres,

Linnæan Genera.	English Names.
Helicteres,	— — Screw-Tree.
Kleinhovia.	

SECTION III.

Plants with one or more sets of united Stamina.

Adansonia,	— — Æthiopian Sourgourd, or African Calabash-Tree.
Alcea,	— — Hollyhock, or Rose-Mallow.
Althæa,	— — Marsh-mallow.
Bombax,	— — Silk Cotton-Tree.
Camellia.	
Gossypium,	— — Cotton.
Hermannia.	
Hibiscus,	— — Althæa Frutex, or Syrian Mallow.
Lavatera,	— — Sea Tree-Mallow.
Malope,	— — Bastard Mallow.
Malva,	— — Mallow.
Melochia.	
Napæa.	
Pentapetes,	— — Indian vervain Mallow.
Sida,	— — Indian Mallow.
Stewartia.	
Theobroma,	— — Chocolate-nut, or Bastard Cedar of Jamaica.
Urena.	
Waltheria.	

Habit and Structure of the Plants of this Order.

This order furnishes a choice and curious collection of herbs both annual and perennial, shrubs, and trees. These are very different in point of size and height, from the creeping mallows, and low shrubby tea-tree, to the lofty limes, and still more lofty silk cotton-trees, which, by some modern writers, are affirmed to be so large, as not to be fathomed

fathomed by ſixteen men, and ſo tall; that an arrow cannot reach their top.

The ſize of the African calabaſh-tree, or Æthiopian ſour-gourd, the Baobab of Proſper Alpinus, as deſcribed by M. Adanſon, is truly amazing. The diameter of the trunk, he ſays, frequently exceeds 25 feet; and the breadth of the tree at top, meaſures from 120 to 150 feet. The horizontal branches, he continues, are from 45 to 55 feet long; and ſo large in circumference, that each branch is equal to a monſtrous tree in Europe. The roots too, where the water of a neighbouring river has waſhed away the earth ſo as to leave them bare and open to view, meaſure one hundred and ten feet long, excluſive of thoſe parts which remain covered with earth, or ſand; and yet, amazing as theſe dimenſions are, the height of the talleſt tree, mentioned by that author, does not exceed ſeventy feet. *Vide* Adanſon's *Voyage au Senegal, & Famille des Plantes*, Tom. 1, p. 211. *Preface.*

The ſhrubs and trees of this order are deciduous, pretty thick, of a beautiful appearance, with an erect ſtem, which is formed by its branches and foliage into a round head.

The ROOTS are extremely long, branch but little, and either run perpendicularly downwards, as in plants of the firſt and ſecond ſections; or extend themſelves horizontally below the ſurface, as in thoſe of the third.

The STEMS are cylindric. The young branches, though commonly of the ſame figure, are ſometimes angular.

The BARK is thick, and pliant.

The WOOD, in general, very ſoft and light.

The BUDS are of a conic form, naked, that is, without ſcales, and ſituated either at the extremity of the branches, or in the angle formed by the branch and leaf. Syrian mallow, Ethiopian ſourgourd, and *lavatera*, have no buds.

The LEAVES are alternate, ſimple, divided into ſeveral lobes, and frequently hand or finger-ſhaped. The ribs, or nerves, on the back of the leaf, in ſome genera of this order, are provided near their origin with a number of hollow furrows, or glands, which being filled with a clammy honey-like liquor, have been conſidered as ſo many veſſels of ſe-

cretion.

cretion. Egyptian and Syrian ketmia, *hibiſcus*, have one hollow of this kind, placed on the middle rib. The cotton-tree has three, two of which frequently diſappear in cold climates; *urena* has ſometimes three hollows, but moſt commonly one.

The FOOT-STALK of the leaves is cylindric, ſwelled at its origin, and appears jointed at its junction with the branch. In ſome ſpecies of Syrian mallow, and *turnera*, the flowers and leaves are borne on the ſame foot-ſtalks; or, to ſpeak more properly, the foot-ſtalk of the flower proceeds from the foot-ſtalk of the leaf. At each ſide of the foot-ſtalk are generally faſtened two *ſtipulæ*, or ſcales, which are ſimple, of a moderate ſize, commonly erect, and fall before the other leaves of the plant. The glands, or veſſels of ſecretion at the baſe of the leaves in tree montia, furniſh eſſential marks in diſtinguiſhing the ſpecies.

The ſtems and branches of ſome ſpecies of Syrian mallow, and ſilk cotton-tree, are armed with long conic prickles, which in the latter are ſometimes two inches in diameter, and fall off very early, being only faſtened to the bark. A ſpecies of ſilk cotton-tree, called by Linnæus *Bombax pentandrum* from the number of its ſtamina, has its ſtem, when young and tender only, covered with prickles; that of the full grown tree being very ſmooth, and unarmed. Tree-montia, and triumfetta, when young, bear downy leaves; when full grown, thoſe of the former are ſmooth; thoſe of the latter, prickly.

The FLOWERS are univerſally hermaphrodite, except in *kiggelaria*, and a ſpecies of Virginian marſh-mallow, called by Linnæus, *Napæa dioica*; the former of which bears male and female, the latter male and hermaphrodite, flowers on different roots.

In plants of the third ſection, the flowers generally open about nine in the morning, and remain expanded till one o'clock in the afternoon. Theſe ſame flowers, as they wither, are ſubject to change their colour; the red become violet, or purple; the white contract a fleſh colour; and the yellow

yellow turn white. The flowers of *Triumfetta* are rolled or turned backwards, in the night time.

The flowers either terminate the branches, proceed from the angles of the leaves, or are difpofed either fingly, or in a *corymbus*, along the branches, or ftem. *Vide* CORYMBUS.

The FLOWER-CUP is fingle in plants of the firft and fecond fections; but frequently double in thofe of the third. In thefe laft, the inner calyx is always of one piece generally divided into five fegments; the outer confifts either of one leaf, as in cotton-tree, and marfh-mallow; of three diftinct leaves, as in mallow and baftard-mallow; or of many, as in Syrian mallow. The fmall fcales, which frequently accompany the calyx of Indian vervain-mallow, *pentapetes*, are not a fecond calyx, as Miller fancies, but *ftipulæ*, which fall off foon after their production. *Vide* STIPULA.

The calyx, when fingle, is fometimes compofed of one leaf, which is permanent; as in arnotta, and *hermannia*: or of feveral diftinct leaves, which, in plants of the firft fection, are generally coloured, and fall off with the petals; as in *microcos* and Jew's-mallow.

In plants that have a double calyx, both flower-cups are generally permanent.

The PETALS in this order, are in number from four to nine; five is the prevailing number. In fome fpecies of filk cotton-tree, the flower confifts of one petal only, which is fhaped like a funnel, and divided into five fegments at top; moft flowers of the tea-tree have fix petals; fome, however, are obferved to have nine, three of which are external, equal, and of a middling fize; fix internal, equal, and very large. Arnotta has a double *corolla*, or rather a double row of petals; each row confifting of five oblong and large petals, which are equal. Plants of the third fection have univerfally five petals, which are heart-fhaped, terminated below by a claw or ftalk which attaches them to the receptacle of the calyx, and clofely embrace or infold each other above, fo as to form the appearance of a fingle petal. They are alternate with the divifions of the calyx, and fall

foon

ſoon after their expanſion. The lapping, or embracing of the petals juſt mentioned, is always found to be in a direction contrary to the apparent diurnal motion of the ſun.

In many flowers of this order is found that ſpecies of ſuperfluity to which Linnæus has given the indefinite name of NECTARIUM; this appearance adds greatly to the beauty of the flower; and is particularly conſpicuous in *hermannia*, chocolate-nut, *kiggelaria*, and the plants of the ſecond ſection. *Vide Supra.*

The ſpring flowers of a ſpecies of Jew's-mallow, called by Linnæus *corchorus ſiliquoſus*, have no petals, and but four ſtamina; the autumnal flowers of the ſame ſpecies have five petals, and numerous ſtamina. A ſpecies of ſcrew-tree, termed *helicteres apetala*, wants likewiſe the petals, as the name imports.

The STAMINA, which are in number from five to twenty, and upwards, are generally inſerted into the common receptacle of the calyx, in plants of the firſt and third ſections; into the *piſtillum*, or ſeed-bud, in thoſe of the ſecond.

The FILAMENTS, or threads of the ſtamina, are diſtinct in the two firſt ſections; but in the third are united into a cylinder, which proceeding from the receptacle of the calyx, ſurrounds the ſeed-bud, and attaches itſelf to the baſe of the petals, which it ſlightly unites. Silk cotton-tree has the appearance of ſeveral ſets of ſtamina ſo united; and, in the genus *pentapetes*, are interſperſed betwixt the fertile ſtamina, which are fifteen in number, five longer filaments that are coloured, erect, and caſtrated, that is, without anthers.

The ANTHERS, or tops, are frequently roundiſh, and placed erect on the filament; moſt commonly, however, they are oblong, or kidney-ſhaped, and ſlightly attached by the middle, or ſides, to the filaments, on which they turn like a vane, or needle. *Vide* ANTHERÆ *Incumbentes*, & *Verſatiles*.

This laſt is particularly the characteriſtic of all the mallow tribe.

Heliocarpus has twin anthers, or two upon each filament; chocolate nut, five.

In *kiggelaria*, the tops are perforated, and gape in two different places.

The SEED-BUD is generally roundifh, or conic, and fometimes, as in tea-tree, angular.

The genus *grevia* has its feed-bud furnifhed with a long foot-ftalk, by which it is attached to a receptacle fhaped like a pillar, erect, and cut into five angles at its brim.

From the fummit of the feed-bud arife the ftyles, which in this order are from one to five, thread-fhaped, of the length of the ftamina, and crowned with a *ftigma*, which is generally thick, blunt, and fometimes cornered.

Muntingia has a hairy feed-bud, no ftyle, and a five cornered *ftigma*, or fummit.

In plants of the third fection, which have a true claffic character, the receptacle of the fructification, or that to which the flower and fruit are attached, is prominent in the centre of the flower. The feed-bud is erect, and furrounds the top of the receptacle in a jointed ring. The ftyle forms one body with the receptacle below, but is generally divided above into as many branches, or threads, as there are cells, or partitions in the feed-bud. Each of thefe branches is crowned with a thin, fpreading, and frequently hairy *ftigma*.

The SEED-VESSEL is generally a capfule; fometimes a pulpy fruit of the berry, or cherry kind. In plants of the third fection, it is a woody, or membranous capfule, which is divided into as many cells internally, as there were partitions in the feed-bud. The capfule, in thefe fame plants, is frequently formed by the union of fo many proper coats, or coverings of the feed, called by Linnæus *arilli*. *Vide* ARILLUS.

The capfule of the lime-tree is divided into five cells; yet, as only one feed arrives at perfection, the reft proving abortive, we might be apt, without previoufly viewing them in the feed-bud, to commit a miftake, and conclude that the capfule was furnifhed with only one cavity. A fimilar abortion fometimes takes place in the genus *triumfetta*, which has

a round

a round capſule, armed on every ſide with ſtrong hooked prickles.

Tree-montia has a hooked ſeed-veſſel of the ſame kind.

The ſeed-veſſel of the genus *hibiſcus*, is generally a capſule; in a particular ſpecies, called by Linnæus *hibiſcus malaviſcus*, it is a roundiſh berry, with five cells containing ten ſeeds. *Stewartia*, according to the ſame author, has a dry ſeed-veſſel, of the apple kind.

In tea-tree, and hermannia, the capſule ſplits at the top; in lime-tree, at the baſe. The woody capſule of Ethiopian ſour gourd does not ſplit, or open at all.

The SEEDS are generally ſolitary; ſometimes angular, and, in plants of the laſt ſection, kidney-ſhaped.

Theſe plants are mucilaginous, and lubricating.

The lime-tree contains a gummy juice, which being repeatedly boiled and clarified, produces a ſubſtance like ſugar. Arnotto is bitter, and aromatic. The freſh, or green leaves of tea, according to Kæmpfer, are diſagreeably bitter, narcotick, and injurious to the brain and nerves; but theſe bad qualities are entirely deſtroyed by the preparation which they undergo before they are expoſed to ſale.

Applied externally, theſe plants, particularly thoſe of the laſt ſection, are highly emollient; taken internally, they correct acrid humours, allay exceſſive heats in the blood, internal inflammations, irritations, and heat of urine; and are of great benefit in the cough, ſtrangury, ſtone, and cholic.

The ſeeds of arnotta, within their capſule, are covered on the ſurface with a reddiſh powder, or duſt, with which the American Indians paint their bodies. This powder, ſaid to be uſed ſometimes as an antidote againſt poiſon, is taken off by ſteeping the ſeeds in hot water, until it has totally ſubſided; the water being then poured off, the ſediment is left to harden, and afterwards made up in balls, which are ſent to Europe, for the uſe of dyers, and painters.

The leaves of common Jew's-mallow, the *olus judaicum* of Avicenna, are uſed in the Eaſt Indies, and by the Jews about Aleppo, as a pot-herb. *Rauwolf's Travels.*

An infusion of the flowers of the lime-tree has been used with succefs in an epilepfy. The timber, which is too soft for any strong purpofes, is principally employed by the carvers, and turners, as likewife by architects, for framing the models of their buildings. The flowers of the Carolina lime-tree emit a very fragrant odour, and are constantly haunted by bees during their continuance.

The Negroes of Senegal, in Africa, put a very high value on a decoction of the bark of a fpecies of *Grevia*, which they call *Kell*, and confider as a never failing fpecific in venereal complaints.

The fcrew-tree derives its name from the figure and appearance of the fruit or feed-veffel, which is compofed of five capfules that are clofely and fpirally twifted over one another like a fcrew; they are hairy, and confift each of one cell inclofing feveral kidney-fhaped feeds.

Profper Alpinus, in his Hiftory of Egyptian Plants, defcribing Ethiopian fourgourd, by the name of *Baobab*, affirms that the much celebrated Lemnian Earth, was nothing elfe than a preparation of the powder of the fungous and four pulp, furrounding the feeds of that tree, which M. Adanfon afferts had been tranfported from Senegal into Egypt, by the Arabs. Be that as it may, we are affured from very good authority, that the powder in queftion is very much ufed at this day, both in decoction and infufion, not only in Cairo, but in all parts of the Levant, for thick, fizy blood, diarrhœas, peftilential and putrid fevers, and diforders arifing from fimilar caufes. At Senegal, this powder is applied to the fame purpofes; as is likewife that of the leaves of the tree, a quantity of which the Negroes mix every day in their food. To this laft powder they have given the name of *Lalo*.

The age of this tree is, perhaps, not lefs remarkable than its enormous fize. M. Adanfon relates, that in a botanical excurfion to the Magdalen Iflands, in the neighbourhood of Goree, he difcovered fome calabafh-trees, from five to fix feet diameter, on the bark of which were engraved, or cut to a confiderable depth, a number of European names. Two

of

of theſe names, which he was at the trouble to repair, were dated, one the fourteenth, the other the fifteenth century. The letters were about ſix inches long, but in breadth they occupied a very ſmall part only of the circumference of the trunk: from whence he concluded, they had not been cut when theſe trees were young. Theſe inſcriptions, however, he thinks ſufficient to determine pretty nearly the age which theſe calabaſh-trees may attain; for, even ſuppoſing that thoſe in queſtion were cut in their early years, and that the trees grew to the diameter of ſix feet in two centuries, as the engraved letters evince, how many centuries muſt be requiſite to give them a diameter of twenty-five feet, which, perhaps, is not the laſt term of their growth!

The inſcribed trees, mentioned by this ingenious Frenchman, had been ſeen in 1555, almoſt two centuries before, by Thevet, who mentions them in the relation of his Voyage to Terra Antarctica, or Auſtralis. Adanſon ſaw them in 1749.

The ſilk cotton-tree (*Bombax*) is a native both of the Eaſt and Weſt Indies, and takes its name from the fine ſilky down with which the ſeeds are wrapped within the capſule, and which, in different ſpecies, is of different colours, and in different degrees of eſtimation. The dark ſhort down, or cotton, is ſeldom uſed, except by the poorer ſort, for ſtuffing pillows or chairs; being generally eſteemed unwholſome to lie upon. By the inhabitants of the Spaniſh Weſt Indies, the beautiful purple down is ſpun, wrought into cloaths, and wore, without being dyed of any other colour.

Large pirogues, or canoes fit to carry a ſail, are made both at Senegal, and in America, of the trunk of the ſilk cotton-tree, the wood of which is very light, and found unfit for any other purpoſe. In Columbus's firſt voyage, ſays Miller, it was reported a canoe was ſeen at the iſland of Cuba, made of the hollow trunk of one of theſe trees, which was ninety-five palms long, of a proportionable width, and capable of containing a hundred and fifty men. *Vide* Miller's Gardener's Dict. voce Bombax.

Boſman, in his Deſcription of Guinea, ſays, he has ſeen one

one of theſe trees ſo widely diffuſed that 20,000 men, cloſely armed, might eaſily ſtand under the branches.

Cotton-wool is the produce of the ſmall, or ſhrubby cotton-tree. This plant grows in form of a buſh, and ſends forth branches that ſtretch wide, and are garniſhed with leaves ſomewhat leſs than thoſe of the ſycamore, but almoſt of the ſame ſhape. It bears a great many fine yellow large flowers compoſed of five petals, each of which is tinged at the bottom with a purple colour. The ſeed-bud, which is of the ſame colour, is placed in the middle of the flower. It is of an oval or conic ſhape, and grows in time to the ſize of a pigeon's-egg. When ripe, it becomes black, and ſplits into three or four partitions at top, diſcovering the cotton, or down, which infolds the ſeeds, and appears white as ſnow, in as many flakes as there are cells or internal diviſions in the capſule. In theſe flakes, which ſwell with the heat to a conſiderable bigneſs, are interſperſed ſeveral black ſeeds, as large as lupines, of a ſweet taſte, white within, oily, and adhering together.

The cotton, of which, in the Eaſt Indies, they make their fineſt calico, is too well known to require a farther deſcription. Suffice it to obſerve with Mr. Hughes, in his Natural Hiſtory of Barbadoes, that indulgent Providence has ſufficiently ſupplied the want of wool, denied to the ſheep in the warmer climates, by cauſing a vegetable, in ſuch countries, to bear the fineſt wool in the world.

The certainty of gathering a good crop of this kind, is very precarious; ſince it may be almoſt literally ſaid of this ſhrub, that in the morning it is green, and flouriſhes; and almoſt in the ſame evening, withers, and decays. For when the worms begin to prey upon a whole field of cotton-trees, though they are at firſt ſcarce perceptible to the naked eye, yet, in three days, they will grow to ſuch a ſize, and prove ſo deſtructive, as to reduce the moſt verdant field, thickly and beautifully cloathed with leaves and flowers, into almoſt as deſolate and naked a condition as trees are in the month of December, in England. When theſe worms, which are of the caterpillar kind, have attained their full growth, they ſpin, and inwrap themſelves as in a bag, or web,

like

like ſilk-worms, in the few remaining leaves, or any other covering: and after a few days reſt in this their Aurelia-ſtate, turn into dark-coloured moths and fly away.

Cotton-flowers, if carefully wrapped up in the leaves of the ſame tree, and baked, or roaſted over a fire of burning coals, yield, ſays Pomet, a reddiſh viſcous oil, that quickly cures old ſtanding ulcers. Of the black ſeed an oil may be made, which beautifies the face, removes ſpots and freckles, and poſſeſſes the ſame virtues with the oil of cokar-kernels. The cotton, or down itſelf, is ſaid to do wonders in the gout, by being burnt upon the part; but its efficacy can be no other than that of fire, or quick-lime; whatever good attends this practice being wholly owing to the burning.

The flowers of the China roſe, *hibiſcus mutabilis*, (ſo termed by Linnæus from the circumſtance to be mentioned), alter remarkably in their colour. At their firſt expanſion, they are white; they then change to a deep red, or roſe colour, which, as they decay, turns to a purple. In the Weſt-Indies, where it goes by the name of Martinico roſe, all theſe alterations happen in the courſe of one day; which, in thoſe hot countries, is the longeſt duration of the flowers in queſtion; but in England, where they continue near a week in perfection, the changes are not ſo ſudden.

Tree vervain mallow of Java, another ſpecies of *hibiſcus*, the *Roſa ſinenſis* of Linnæus, produces double flowers, compoſed of ſeveral roundiſh petals of a red colour, which expand like the common roſe. With theſe flowers, the women on the coaſt of Malabar, where the plant naturally grows, tinge their hair and eye-brows of a black colour, which will not waſh off; the Engliſh reſiding on the ſame coaſt, uſe it for blacking their ſhoes, and thence have named it ſhoe-flower. The green leaves, whiſked in water, make a lather like that which is made with ſoap; and, as we are informed by Kolben, are preferred to that ſubſtance for waſhing the hands and face, by the Europeans at the Cape of Good Hope, where the plant has long been introduced from India.

The leaves of a North American ſpecies of *hibiſcus*,

termed by Linnæus *Moſcheutos*, from a very probable conjecture that it is the *Moſcheuton* or true roſe-mallow of Pliny, are ſoft, and in figure reſemble thoſe of the maple. The flower is very large, and white, and ſeated not on the peduncle, but petiole or foot-ſtalk of the leaves, like that of *Turnera ulmifolia*. The root employed in medicine, ſays Clayton, has a paregorick or pain-alleviating quality.

A ſpecies of *Hibiſcus*, the *populneus* of Linnæus, the *Novella* of Rumphius, the *Bupariti* of the *Hortus Malabaricus*, is termed, by the natives of Ceylon, Surighahas, that is, Sun-Tree. The flowers, which, as others of the ſame genus, are ephemeral, have a dingy gloomy colour at the riſing of the ſun, when they expand; but acquire a reddiſh hue at its ſetting, when they fall off.

The fig-leaved *hibiſcus* is cultivated by the inhabitants of the Weſt-Indies for its pods, which, having a ſoft viſcous juice, add a thickneſs to their ſoups, and render them palatable.

The fruit of the okra, the *Hibiſcus eſculentus* of Linnæus, is taken, when young and tender, and boiled, and eaten with butter. The plant itſelf is of a very mucilaginous nature, a great reſtorative, very wholeſome, and extremely lubricating. It is perhaps the plant which the Romans valued ſo much, and Horace ſo well characterizes by the name of *levis malva*, or light mallow, which proves of eaſy digeſtion, and lightens the ſtomach *.

A thimble full of the ſmall browniſh ſeeds of a ſpecies of hollyhock, or tree-mallow, deſcribed by Hughes, in his Natural Hiſtory of Barbadoes, taken inwardly, proves an excellent purge; and the yellow juice that plentifully diſtils from the ſtalk when broken, is a ſovereign remedy to cure old ulcers.

A decoction of the roots of a ſpecies of *napæa*, called by the Negroes *laſs*, is deemed a ſovereign remedy in the vene-

* ———————— "*Me paſcunt olivæ,*
Me cichorea, LEVESQUE MALVÆ."

Carm. Lib. I. Od. 31.

real

real difeafe, which they are faid to cure without any bad confequences, by means of this plant alone.

Note. The name of the genus *Napæa*, is derived from the Greek ναπη, *faltus, lucus, vel vallis*, a grove, or valley, and expreffive of the places where the plants which compofe it are generally found. In the Mythology of the Poets, the Nymphs, who prefided over fuch retreats, were called *Napææ*.

In the parts of the fructification of the genera *Adanfonia* and *Bombax*, there is a remarkable affinity. They, indeed, principally differ in the feeds, which, in the firft genus, are involved in a friable pulp; in the latter, covered with the foft, filky fubftance, from which it has obtained both its fcientific and Englifh names.

Common marfh-mallow, the *althæa officinalis* of Linnæus, is an herbaceous perennial, which grows naturally in moift places, in feveral provinces of England, France, Holland, and in Siberia. The juice is infipid to the tafte, and, in the roots, mucilaginous. The herb, flowers, and root, which laft is one of the five emollients, are employed in medicine. They are efteemed balfamic and pectoral, and frequently ordered in fomentations to eafe pain, as likewife to fuppurate tumours and impofthumes. The feeds are rarely ufed. Marfh-mallow may be diftinguifhed from the tribe of common-mallow, principally by the foftnefs and length of the leaves.

From the bark of moft plants of the mallow-tribe, may be procured a fort of hemp, which, if properly managed, might be wrought into cordage, or indeed into fine ftrong thread of any fize.

The inhabitants of the Weft-Indies cut the Indian mallows, *fida*, in the fame manner as we do heath, and make them up into brooms for fweeping. Hence they are frequently fent into Britain by the title of broom-weed. A cataplafm of the pounded leaves of the fame plant is reckoned an excellent vulnerary.

I conclude this article of the pillar-fhaped-flowers, with a fhort hiftory of the Tea-plant, its culture, growth, preparation,

paration, and ufes, from the accurate defcription of Kæmpfer, in his Natural Hiftory of Japan.

This fhrub, formerly defcribed by Dr. Breynius, in his Century of Exotic Plants, publifhed at Dantzick, in 1678, is of a very flow growth, and diminutive fize. It has a black, woody, irregularly branched root. The rifing ftem foon fpreads into many irregular branches, and twigs. Thefe, at the lower end, and near the ground, often feem to be more in number than they really are; for feveral feeds being put together in one hole, it frequently happens that two, three, or more fhrubs grow up together, and fo clofe to one another, as to be eafily miftaken for one, by ignorant, or lefs attentive obfervers. The bark is dry, thin, weak, chefnut-coloured, firm, and adheres clofely to the wood. It is covered with a very thin fkin, which being removed, the bark appears, of a greenifh colour, bitter naufeous and aftringent tafte, with a fmell much like the leaves of hazelnut tree, only more difagreeable and offenfive. The wood is hard, fibrous, of a greenifh colour inclining to white, and of a very offenfive fmell, when green. The pith is very fmall, and adheres clofe to the wood. The branches and twigs are flender, of different fizes, irregularly befet with fimple leaves ftanding on very fmall, fat, green foot-ftalks, and refembling, when full grown, the leaves of the garden cherry-tree; but when young, tender, and gathered for ufe, thofe of the common fpindle-tree, the colour only excepted. The leaves are fmooth on both fides, clofely and unequally fawed on the edge, of a dirty dark green colour, which is fomewhat lighter on the back, where the nerves being raifed confiderably, leave fo many hollows, or furrows on the oppofite fide. They have one very confpicuous nerve in the middle, which is branched out on each fide into five, fix, or feven thin tranfverfe ribs, of different lengths, and bent backwards, near the edges of the leaves: between thefe tranfverfe ribs, run a number of fmall veins. The leaves, when frefh, have no fmell at all, and though aftringent and bitterifh, as we obferved above, are not naufeous, as the bark. They differ very much in fubftance, fize, and fhape,

 according

according to their age, and the ſituation and nature of the ſoil in which the ſhrub is planted. From the wings of the leaves come forth the flowers in autumn. Theſe continue to grow till late in winter, and are compoſed of ſix petals, one or two of which are generally ſhrunk, and fall far ſhort of the largeneſs and beauty of the others. The foot-ſtalk of the flower is about half an inch long, and ends in ſix very ſmall green leaves, which ſerve inſtead of the calyx, or flower-cup. This deſcription, applied by Kæmpfer to the ſhrub, which, as he pretends, produces all the different ſorts, or preparations of tea, correſponds, ſays Linnæus, to a particular ſpecies only, termed by him Bohea; for ſome tea plants, he obſerves after Dr. Hill, produce flowers compoſed of nine petals, which muſt therefore conſtitute a diſtinct ſpecies from ſuch as have only ſix. From this circumſtance is conſtructed the other ſpecies of that author, *thea viridis*, or green tea, the flowers of which have always nine petals.

To proceed in our deſcription. Within the petals, which are of a very unpleaſant bitteriſh taſte, are placed many white ſtamina, exceedingly ſmall as in the wild roſe, with yellow heads in ſhape not unlike a heart. Kæmpfer reckoned in one flower, two hundred and thirty of theſe ſtamina. To the flowers ſucceed the fruits in great plenty; theſe are compoſed of one, two, but moſt commonly of three capſules, of the bigneſs of wild plumbs, adhering, like the ſeed-veſſels of the palma chriſti, to one common foot-ſtalk as to a centre, but divided into three pretty deep partitions. From this character, we may ſee how improperly Linnæus has placed the tea-tree in the natural order we have been deſcribing, when the ſtriking circumſtance of its tricapſular fruit ſeemed ſo naturally to point out its connection and affinity with thoſe plants which poſſeſs the ſame remarkable character. *Vide* TRICOCCÆ. Each capſule contains a huſk, nut, and ſeed. The kernel, or ſeed, is reddiſh, of a firm ſubſtance like filberds, contains a great quantity of oil, and is very apt to grow rank, which is the reaſon why there are ſcarce two in ten that will germinate when ſown. The

natives

natives make no manner of ufe of either the flowers, or kernels.

The fhrub muft be, at leaft, of three years growth, before the leaves, which it then bears in plenty, are fit to be plucked. In feven years time, or thereabouts, it rifes to a man's height; but as it then grows flowly, and bears but few leaves, the natives generally cut it down quite to the ftem, after having firft gathered what few leaves it produced. The next year, out of the remaining ftem proceed many young twigs and branches, which bear fuch abundance of leaves, as fufficiently compenfates for the lofs of the former fhrub. Some defer the operation of cuting down to the ftem, till the fhrub is of ten years growth.

The leaves muft not be tore off by handfuls, but plucked carefully one by one, and are not to be gathered all at once, but at different times. Thofe who pluck their fhrubs thrice a year, begin their firft gathering about the end of February. The fhrub then bears but a few leaves, which are very tender and young, and not yet fully opened, as being fcarce above two or three days growth. Thefe fmall and tender leaves are reckoned much better than the reft, and, becaufe of their fcarcity and price, are difpofed of only to princes and rich people; for which reafon they are called Imperial tea, and by fome the flower of tea. The fecond gathering, and the firft of thofe who gather but twice a year, is made about the latter end of March, or beginning of April; fome of the leaves are then already come to perfection, others are but half grown; both, however, are plucked off promifcuoufly, though care is afterwards taken, previous to the ufual preparation, to arrange them into claffes, according to their fize and goodnefs. The third, and laft gathering, which is alfo the moft plentiful, is made in the end of May, when the leaves have attained their full growth, both in number and fize. The leaves of this gathering are arranged in like manner as the former, according to their fize and goodnefs, into different claffes, the loweft of which contains the coarfeft leaves of all, being full two months grown, and that fort which is commonly drunk by the vulgar.

The

The preparation of the leaves confifts in drying or roafting them when frefh gathered, over the fire, in an iron pan, and rolling them when hot with the palm of the hand on a mat, till they become curled. The particulars of this preparation, as related by the ingenious author from whom this defcription is extracted, are much too tedious for my purpofe. The reader is therefore referred to the work itfelf. *Vide* Kæmpfer's Hiftory of Japan, Vol. 2, Appendix 1.

The tea, after having undergone a fufficient roafting and curling, muft, when cold, be put up, and carefully kept from the air. In this, indeed, the whole art of preferving it chiefly confifts; becaufe the air, in thofe hot climates, diffipates its extremely fubtile and volatile parts much fooner than it would in our colder European countries. The Chinefe put it up in boxes of a coarfe tin, which, if they be very large, are inclofed in wooden cafes of fir, all the clefts being firft carefully ftopped both within and without. After this manner alfo it is fent abroad into foreign countries. The Japanefe keep their ftock of the common tea in large earthen pots with a narrow mouth. The better fort of tea, I mean that which the emperor himfelf, and the great men make ufe of, is kept in porcelain pots or veffels which are fuppofed to improve its virtues. The coarfe tea of the third gathering is not fo eafily injured by the air as the other forts; for though its virtues are comparatively fewer, and lefs fenfible, yet are they more conftant and fixed. The country people keep it, as well as the other forts which they ufe, in ftraw bafkets made like barrels, which they put under the roofs of their houfes, near the hole which lets out the fmoak; being of opinion, that nothing is better than fmoak to preferve the virtues of the leaves, and even improve them. Some put it up with common mug-wort flowers, or the young leaves of a plant called fafanqua, which they believe renders it much more agreeable. Other odoriferous and aromatic fubftances are found, upon trial, to produce no fuch beneficial effect.

The tea, as it is taken inwardly, is prepared in two different ways. The firft, ufed by the Chinefe, and now all over

Europe, is nothing elſe but a ſimple infuſion of the leaves in hot water. The other way, which is peculiar to the Japaneſe, is by grinding. In this preparation, the leaves are, by means of a hand-mill made of a black-greeniſh ſtone, called ſerpentine ſtone, reduced into a fine delicate powder, which being mixed with hot water into a thin pulp, is afterwards ſipped. This tea is called thick tea, to diſtinguiſh it from the ſimple infuſion, and is drunk every day by the rich people and great men in Japan.

The narcotic quality of the freſh unprepared leaves of tea, mentioned above, is deſtroyed in a great meaſure, by a repeated and gradual roaſting. This operation renders it exhilarating, refreſhing, and cleanſing. Kæmpfer obſerves, that tea is particularly ſerviceable in waſhing away that tartarous matter, which is the efficient cauſe of calculous concretions, nephritic and gouty diſtempers; and affirms that among the great tea-drinkers of Japan, he never met with any, who were troubled with the gout, or ſtone.

The leaves of tea, ſay writers on the Materia Medica, are much more uſed for pleaſure than as medicine; the Bohea, however, is eſteemed ſoftening, nouriſhing, and proper in all inward decays; the Green is diuretic, carries an agreeable roughneſs with it into the ſtomach, which gently aſtringes the fibres, and gives them ſuch a tenſeneſs as is neceſſary for a good digeſtion. Improper, or exceſſive uſe, may, no doubt, render this, or any thing elſe, prejudicial; but, in general, there are very few herbs employed, either in food or medicine, which, uſed with moderation, are better, pleaſanter, or ſafer than tea.

After the moſt diligent enquiries that I have been able to make, I do not find that the tea-plant grows naturally beyond the thirty-fifth degree of north latitude towards the equator, on the one hand, and the forty-fifth degree towards the pole, on the other.

COMA, a buſh of hair; a collection of large *bracteæ*, or floral leaves, which, in crown imperial, lavender, ſage, cow-wheat, and ſome other plants, terminate the flower-ſtem, and form an appearance like a tuft or buſh of hair. *Vide* BRACTEA.

COMMUNES. The name of a clafs in Linnæus's *Methodus Calycina*, confifting of plants which, like teafel and dandelion, have a calyx or flower-cup common to many flowers or florets. Thefe are the aggregate and compound flowers of other fyftems. *Vide* AGGREGATUS and COMPOSITUS *Flos*.

COMOSÆ, from *coma*. An order of plants in the former editions of Linnæus's Fragments of a Natural Method, confifting of the fpiked willow, or fpiræa frutex, drop-wort, and greater meadow-fweet. Thefe, though formerly diftinct genera, are now by Linnæus collected into one, under the name of *fpiræa*. The flowers, growing in a head, refemble a bufh or tuft of hair, which probably gave rife to the epithet *comofæ*.

COMPLETUS *Flos*, a complete flower. A flower is faid to be complete which is provided with both the covers, viz. the calyx or flower-cup, and the petals. *Vide* CALYX *and* COROLLA.

The term was invented by Vaillant, and is fynonimous to *Calyculatus Flos*, in Linnæus. Berkenhout erroneoufly confounds it with the *auctus* and *calyculatus calyx* of the fame author.

COMPOSITUS *Flos*, a compound flower; a flower formed of the union of feveral fructifications or leffer flowers within a common calyx; each leffer flower being furnifhed with five ftamina, diftinct at bottom, but united by the anthers into a cylinder, through which paffes a ftyle, confiderably longer than the ftamina, and crowned by a *ftigma*, or fummit, with two divifions that are rolled backwards. Such are the effential characters of a compound flower.

The other properties are as follows:

1. The common receptacle, or feat upon which all the leffer flowers are placed, is large, and entire, that is, undivided.

2. The leffer flowers themfelves confift univerfally each of one petal, which fits upon the receptacle without any foot-ftalk, and is of different figures in different genera.

3. Under each floret, or partial flower, is generally placed a ſingle ſeed.

A compound flower receives different appellations from the figure of its monopetalous florets. When theſe are all hollow like a tube at the baſe only, flat in the middle, and expanded towards the top, the flower is ſaid to be *ligulated*, or *lingulated*; that is, compoſed of florets which reſemble a ſtrap, fillet, or tongue, (*Ligula*, *Lingua*.) This ſpecies of compound flower is termed by Ray, *Planipetalus*, and by Tournefort, *Semifloſculoſus*, from the ſemi-florets of which it is made up; and is exemplified in dandelion, hawk-weed, nipple-wort, and ſeveral others.

When all the florets are funnel-ſhaped, that is, hollow almoſt from bottom to top, the flower is termed by Linnæus *Tubular*, and by Tournefort *Floſcular*, to diſtinguiſh it from that compoſed of the ſemi-florets mentioned above.

Burdock, thiſtle, ſaw-wort, artichoke, baſtard-ſaffron, alpine colt's foot, and ſeveral other flowers, furniſh examples.

Tubular, or hollow florets, are florets properly ſo called. —Again, when a compound flower conſiſts of florets and ſemi-florets mixed together, *floſculis ligulatis & tubuloſis*, it is called, both by Tournefort and Linnæus, *Flos radiatus*, from the ſemi-florets which generally occupy the circumference, margin, or outward part of the flower, termed by Linnæus *Radius*, and reſemble the rays proceeding from the diſk, or body of the ſun. The centre of a radiated compound flower, termed by Linnæus *Diſcus*, is always compoſed of florets properly ſo called: the circumference, (*Radius*,) generally of ſemi-florets, as in milfoil; ſometimes, of tubular, or hollow florets unlike thoſe of the centre, as in blue bottle. In mugwort, and cudweed, the partial flowers in the circumference are naked; that is, want petals altogether.

The florets and ſemi-florets of a compound flower, are generally very numerous. In the following examples, they conſiſt of a determinate number.

Wild lettuce conſiſts of five ſemi-florets.

Hemp-agrimony with a fig-wort leaf, of twenty florets.

Hemp-

Hemp-agrimony with long ſage-like leaves, *eupatorium perfoliatum*, of fifteen.

Finger-leaved hemp-agrimony, of five.

Twining hemp-agrimony, of four.

The ſemi-florets in the circumference, or margin of a radiated flower, are commonly indeterminate in point of number. The following are exceptions.

Arctotis, has twenty.

Dwarf ſun-flower, twelve.

Tetragonotheca, and hard-ſeeded *chryſanthemum*, ten.

Tick-ſeeded ſun-flower, and African-ragwort, eight.

Milfoil, *eriocephalus*, baſtard-cudweed, *ſeriphium*, *ſigiſbeckia*, *melampodium*, *chryſogonum*, and African-marigold, have five.

The genus *milleria* has only one ſemifloret in the margin; generally two, and ſometimes four florets in the center.

The florets and ſemi-florets in compound flowers that are not radiated, are generally hermaphrodite, that is, have both male and female organs within the ſame cover.

In radiated flowers, the florets, which occupy the centre, are all hermaphrodite, or male; the ſemi-florets, which conſtitute the rays, or margin, are always female. *Vide* MASCULUS, FEMINEUS, and HERMAPHRODITUS *Flos.*

The eſſence of a compound flower, conſiſting, as we have ſaid, in the union of the *anthers* into a cylinder, the genus *kuhnia*, although very nearly allied to hemp-agrimony, and indeed, in every other reſpect, like a compound flower, is very properly referred, by Linnæus, to a claſs containing ſimple flowers, becauſe the anthers are ſeparate and diſtinct.

All compound flowers are aggregate. *Vide* AGGREGATUS *Flos.*

The common calyx, and common receptacle, though generally preſent in compound flowers, ſcarce enter into the number of eſſential characters. The former is wanting in globe-thiſtle; the latter in *milleria*.

Compound flowers which conſtitute the 12th, 13th, and

14th classes in Tournefort's Method, are all reduced to the class *Syngenesia* in the Sexual System. *Vide* SYNGENESIA.

COMPOSITÆ. The name of a class in Hermannus, and Royen, as likewise of an order in Linnæus's Fragments of a Natural Method, consisting of plants which agree in the general characters above enumerated.

A particular description of this order is given under the article *Syngenesia*, which includes all the compound flowers. *Vide* SYNGENESIA.

The most accurate and complete observations on this difficult class of plants, are those of Vaillant, and Pontedera, particularly the former, who confining his researches to that part of the vegetable kingdom, published his discoveries and method of arrangement in the Memoirs of the Academy of Sciences at Paris, from 1718 to 1722. This method, which consists of four sections, and is constructed from the disposition of the flowers on the foot-stalks, includes not only the compound flowers properly so called; (I mean those which answer to the description given above,) but likewise all flowers which, like teasel and scabious, form a head, and are contained within a common calyx, or flower-cup. The four sections just mentioned, are subdivided into twenty-three subaltern sections, from the figures of the common and proper calyx, and common receptacle; from the division of the stem, or stalk; from the number and regularity, or irregularity of the petals; from the crown of the seeds; and from the substance of the fruit.

Pontedera, in one of his Botanical Dissertations, divides, like Tournefort, the family of the compound flowers, which he terms *Conglobati*, into three classes; those with semi-florets; those with florets; and those with a mixture of both. These classes, which are subdivided into 24 sections, from an attention to the figure of the common receptacle, and of the partial, or proper calyx of each lesser flower, would have been true natural divisions, if the author had not, like Vaillant, improperly introduced into the second, scabious, teasel, and blue daisy, which are entirely foreign to the family of the compound flowers.

Thus

Thus we have ſeen, that former authors arranged the compound flowers, either from the manner in which they are ſupported on their foot-ſtalks, as J. Bauhin, Vaillant, Ray, and Johnſton; or from the figure and regularity, or irregularity of the petals, as Tournefort, Pontedera, and Rivinus. Linnæus, to preſerve the uniformity of his ſyſtem, has conſtructed his primary diviſions of the compound flowers, from the different ſexes of the florets, which he terms Polygamy. The ſubaltern diviſions are conſtructed from the figure of the petals, the diſpoſition of the flowers, the *pappus* or crown of the ſeed, the common receptacle, and other circumſtances, which characterize the ſubaltern diviſions in other authors.

CONCEPTACULUM, (from *concipio*) a receiver; a ſpecies of ſeed-veſſel, with one valve, which opens from bottom to top on one ſide, and has no ſuture for faſtening, or attaching the ſeeds within it. This term occurs in the *Philoſophia Botanica*, and the other early works of Linnæus. In the *Delineatio Plantæ*, prefixed to the ſecond part of his Syſtem of Nature, and the lateſt editions of the *Genera Plantarum*, *Folliculus* is ſubſtituted in its place. *Vide* Folliculus.

It is exemplified in roſe-bay, red jaſmine, Virginian ſilk, dog's-bane, and ſwallow-wort.

In this ſpecies of ſeed veſſel, the ſeeds are faſtened to a receptacle within the fruit, hence called the recepta c of the ſeeds. *Vide* Receptaculum.

CONGLOBATUS *Flos*, (from *con*, in compoſition, together, and *globus*, a ball); growing together in form of a ſphere, or globe. Pontedera's term for the compound flowers of Tournefort and Linnæus; the flowers forming a head, (*capitati*,) of Ray. *Vide* Compositus *Flos*, &c.

CONGLOMERATI *Flores*, (from *con*, together, and *glomus*, a bottom of yarn). Flowers heaped or wound together; flowers that grow on a branched foot-ſtalk, to which they are irregularly, but cloſely connected. This mode of infloreſcence, as Linnæus terms it, is oppoſed to that in which the flowers are irregularly and looſely ſupported on their

their foot-ſtalks, hence termed a diffuſe panicle. *Vide* PANICULA.

The term is exemplified in ſeveral of the graſſes, particularly in ſome ſpecies of *poa*, feſcue-graſs, and *agroſtis*. *Vide* GRAMINA.

CONGREGATÆ, (*congregare*, to gather together); the 15th claſs in Profeſſor Haller's Natural Method, conſiſting of plants which have a number of flowers placed within a common calyx, under each of which is placed a ſingle naked ſeed. It is exemplified in blue daiſy, ſcabious, and the compound flowers of Linnæus and other botaniſts. *Vide* COMPOSITUS *Flos*.

CONIFERÆ, (from *conus*, a cone, and *fero*, to bear); cone-bearing plants. The name of the fifty-firſt order, in Linnæus's Fragments of a Natural Method, conſiſting of plants, whoſe female flowers, placed at a diſtance from the male, either on the ſame, or diſtinct roots, are formed into a cone. In this character, the only one expreſſed in the title, the plants in queſtion ſeem to be nearly allied to the family of the moſſes, from which, however, they are eaſily diſtinguiſhed by their habit, as well as by the ſtructure of the male flowers in which the ſtamina are united below into a cylinder, and diſtinct at top.

The Genera *contained in this Order are ſeven*: viz.

Linnæan Genera.			*Engliſh Names.*
Cupreſſus	—	—	Cypreſs.
Ephedra	—	—	Shrubby Horſe-tail.
Equiſetum	—	—	Horſe-tail.
Juniperus	—	—	Juniper.
Pinus	—	—	Fir, Pine, Cedar, Larch.
Taxus	—	—	Yew-tree.
Thuja	—	—	Arbor-Vitæ.

The plants of this order are moſtly of the ſhrub and tree kind, and retain their leaves all the year. Horſe-tail is an

herbaceous

herbaceous perennial; some sorts of larch and fir-trees lose their leaves during the winter.

The formof these plants is generally conic, and extremely beautiful, from the disposition of the branches, which cover the stems even to the roots, and extend themselves horizontally, and circularly, like so many rays.

The height of some species of horse-tail does not exceed half a foot; that of some pines approaches to a hundred.

The roots are short, branched, not very fibrous, and extend horizontally.

The STEMS and BRANCHES are cylindric.

The BARK is thin, and split into short slender scales.

The WOOD, except that of the yew-tree, possesses little hardness.

The BUDS are of a conic form, and naked, that is, without scales.

The LEAVES are entire, small, and thick, frequently triangular, and generally pointed. Juniper has a prickly, or thorny leaf.

With respect to situation, they admit of great variety, being either alternate, opposite, placed in whirls round the stem, or collected into small bundles, which proceed from a single point. This last is particularly exemplified in the larch and pine-trees; in the former of which, six or eight leaves, in the latter, from two to five, are produced together all along the stem and branches, out of a very fine membranous sort of sheath. The first leaves, however, of these same trees, are single, and without any sheath, like those of the fir and yew: the young branches too of the larch-tree, which emerge from the middle of the bundles, have their leaves single in like manner.

The leaves are placed upon the branches without any sensible foot-stalk; in horse-tail, and shrubby horse-tail, they form a sheath, or glove, round the stem.

Small STIPULÆ, or scales, are observed at the origin of the young branches of pine and fir-trees; and of the small bundles of leaves of the larch.

 These

These plants, like the mosses, are not covered with any sort of pubescence, or down.

The FLOWERS in this order, are universally male and female. These, in the fir, pine, larch, cypress, and arbor vitæ, are placed at a distance from each other, upon the same root; in the rest, they are produced upon distinct plants. In the pine, fir, and larch trees, the male flowers are collected into a spike, or cone, at the end of the branches; in the other plants of this order they proceed singly from the wings of the leaves, or the termination of the branches.

The female flowers are generally collected into a cone; in yew-tree, and shrubby horse-tail, they are single, and terminate the branches.

The CALYX of the male flowers is a catkin; of the female, a cone.

The PETALS in this order are wanting; except in the female flowers of juniper, which have three rigid, sharp, and permanent petals.

The STAMINA are in number from three to twenty, and upwards; united by their filaments into a cylinder, or pillar, which rises out of the centre of the calyx.

The ANTHERS are erect, distinct, of a round form, and divided into internal partitions or cells, which, in the different genera, are in number from two to ten.

The SEED-BUDS, in this order, are generally numerous, and placed betwixt the scales of the cone, which serve for a calyx. From each seed-bud arises a very short cylindrical style, crowned with a simple *stigma* of a conic form. These plants have properly no fruit, or seed-vessel; the seeds being naked, and involved only by the scales of the calyx. These scales, which compose the cone, are in the pine, of a bony nature, and almost united; in the fir, larch, arbor-vitæ, and cypress, they are of a substance like leather; and in juniper they are united, and become fleshy, and succulent like a berry. The calyx, or cone of shrubby horse-tail, becomes likewise a kind of berry, with a slight opening at top, from whence are discovered its two acute, egg-shaped seeds.

feeds. Laftly, from the bottom of the calyx of the female flowers of yew, is produced a coloured fucculent receptacle, which furrounds the greateft part of a fingle oblong feed, and is only open at top.

The Seeds in this order, being nourifhed, as in a feed-veffel, by the fcales of the cone, or common calyx, differ in nothing from the *germina*, or feed-buds. In pine, fir, larch, and arbor-vitæ, the feeds are hard like a ftone, or nut, and crowned with a large, membranaceous wing of an oblong figure, contained within the fcales of the cone.

Each feed is furnifhed with two covers; the external, hard, and bony; the internal, pulpy, of an oval form, white, very thick, and without any aperture.

The female flowers, and confequently the fruit and feeds of the horfe-tail, a fort of fern, have not yet been difcovered. The fructifications of the male flowers being difpofed on the ftalks, in form of a cone, poffibly determined Linnæus to arrange the genus in this natural order.

Moft of the cone-bearing plants are refinous, or gummy. Thefe gums have a bitter tafte, but a very agreeable fmell; witnefs the incenfe which proceeds from a fpecies of juniper with yellow fruit. By cutting the trunk, and the largeft branches of the common juniper, during the great heats, there flows a gum, called fandarac, which is brought to us from Africa, where the trees grow very large, and in great quantities. This fandarac is called by fome, the Arabian fandarac or varnifh; by others, the varnifh-gum, or gum-juniper, and is of more ufe to artifts, than in phyfic.

From the larch-tree is extracted what we erroneoufly call Venice-turpentine. This fubftance, or natural balfam, flows, at firft, without incifion; when it has done dropping, the poor people who wait in the fir-woods, make incifions at about two or three feet from the ground, into the trunk of the trees, into which they fix narrow troughs, about twenty inches long. The end of thefe troughs is hollowed, like a ladle; and in the middle is a fmall hole bored, for the turpentine to run into a receiver, which is placed below it. As the gummy fubftance runs from the trees, it paffes along the

floping gutter, or trough, to the ladle, and from thence runs through the holes into the receiver. The people who gather it, vifit the trees morning and evening, from the end of May to September, to collect the turpentine out of the receivers. When it flows out of the tree, Venice-turpentine is clear like water, and of a yellowifh white; but, as it grows older, it thickens, and becomes of a citron colour. It is procured in greateft abundance, in the neighbourhood of Lyons, and in the valley of St. Martin, near Lucern, in Switzerland.

From the wild pine, or pineafter, is extracted the common turpentine, which is chiefly ufed by the farriers, and from which is diftilled the oil of that name. The finer and more valuable part of the diftillation comes firft, and is called the fpirit; what is left at the bottom of the ftill, is the common refin.

The pitch-tree, a fpecies of fir, produces the fubftance from which it derives its name.

From the white and black fpruce firs of North-America, oozes a fine clear turpentine, of a ftrong fcent, with which the native Indians are faid to cure green wounds, and fome internal diforders. That particularly of the firft fort, called by Charlevoix, *Epinette Blanche*, or white prickly fir, is affirmed to be a fovereign remedy in fevers, and pains of the breaft and ftomach.

The large branches of the larch-tree, befides its turpentine, produce feveral fmall grains like fugar, which poffeffing the purgative quality of manna, have likewife obtained its name.

Taken internally, thefe plants are aperient, fudorific, diuretic, ftomachic, and antifeptic. An air impregnated with their balfamic exhalations, is reckoned very falutary to confumptive habits.

Juniper berries, and the gum of the larch, give urine a fragrant fmell like that of violets. The cones, or female heads of the cyprefs, improperly called cyprefs-nuts, are highly aftringent. Juniper-wood is fragrant when burnt: for which purpofe it is frequently ufed in houfes, to prevent peftilential diforders, and other infections.

Applied externally, the reſins, particularly thoſe of the pitch and larch trees, are anodyne, deterſive, and antiſeptic. By its bitterneſs, the oil of juniper effectually deſtroys worms. A decoction in milk, of the nuts or ſeeds of the wild pine, otherwiſe called pineaſter, or of the extremities of the branches pulled in ſpring, is ſaid, with a proper regimen, to cure the moſt confirmed and inveterate ſcurvy. A decoction of juniper-berries, is proper for fortifying the ſtomach; that of the wood is employed, like a decoction of ſaſſafras, to promote ſweat, and purify the blood. The ſame medicine, with crude antimony, cures that ſtage of the venereal diſeaſe in which the face is entirely covered over with ulcerous puſtules. Half an ounce of Venice-turpentine mixed in a clyſter, prevents a mortification in putrid and contagious dyſenteries. The ſame ſubſtance is ſpecific in ſuppreſſions of urine.

From the ſeeds or nuts of the cultivated pine, is drawn by expreſſion an oil, which is equal, in point of excellence, to that obtained from hazel-nuts. Theſe ſame nuts or kernels are frequently ſerved up in deſſerts, during the winter-ſeaſon, in Italy; formerly they were uſed in medicine in this country; but of late years, the piſtacia nuts have been generally ſubſtituted in their place. Of the ſoft white ſubſtance, commonly called *alburnum*, which, in trees, lies betwixt the wood and inner bark, the Swedes prepare a diſh that is eſteemed a great delicacy, and much uſed in ſpring. In times of ſcarcity a kind of bread is made of the bark. The natives of Siberia too, we are informed by Gmelin, make great culinary uſe of the *alburnum* of the young pines; which, for that purpoſe, they collect with care, dry, reduce into powder, and mix, as a pleaſing and ſalutary ingredient, in their common food.

Of juniper-berries, and the tops of the branches of a ſpecies of Canadian pitch-tree, is prepared a very ſafe and wholeſome wine.

The wood of the cone-bearing plants is, in general, tender, light, not liable to corrupt, and of a fragrant ſmell. That of the yew-tree is very hard, pliant, ſuſceptible of a good poliſh,

polifh, and poffeffes a red colour, which, for beauty, mey vie with any of the foreign woods.

The white Canadian pines, fays Charlevoix, fhoot out, at the upper extremity, a kind of mufhroom, which the natives call *Guarigue*, and ufe with fuccefs againft diforders of the breaft, and in dyfenteries.

Of the four forts of Canadian firs, enumerated by the fame author, the white prickly kind, and that called *La Peruffe*, are excellent for mafts, efpecially the firft, which is alfo extremely fit for carpenter's work.

The fort termed *La Peruffe*, is gummy, but yields not a quantity fufficient to be made ufe of; its wood remains long in the ground without rotting, which renders it extremely fit for paling, or inclofures. The bark is excellent for tanners, and the Indians make a dye of it, refembling that of a Turkey blue.

The branches of the white and black fpruce-firs, are ufed by the inhabitants of North America, in making the beer, hence commonly known by the name of fpruce-beer.

The ifland of Cyprus, is faid to have received its name from the cyprefs-trees, which grow there in very great abundance.

The timber of the horizontal cyprefs, a native of the Levant, is faid to refift worms, moths, and all putrefaction; and to laft many centuries. The coffins in which the Athenians ufed to bury their heroes, were made, fays Thucydides, of this wood, as were likewife the chefts containing the Egyptian mummies. The doors of St. Peter's church at Rome were originally of the fame material. Thefe, after lafting eleven hundred years, at the end of which time they difcovered not the fmalleft tendency to corruption, were removed by the order of Pope Eugenius the fourth, and gates of brafs fubftituted in their place.

The fame tree is by many eminent authors recommended as meliorating the air by its balfamic and aromatic exhalations; upon which account, many of the antient phyficians of the eaftern countries ufed to fend their patients,

who were troubled with weak lungs, to the iſland of Candia, where theſe trees grew in great abundance, and where, from the ſalubrious air alone, very few failed of a perfect cure.

In the ſame iſland, ſays Miller, the trees in queſtion were ſo lucrative a commodity, that the plantations were called *Dos Filiæ*, the felling of one of them being reckoned a daughter's portion.

Cypreſs, ſays Mr. Pococke, is the only tree that grows towards the top of Mount Lebanon, and being nipped by the cold, does not grow ſpirally, but like a ſmall oak.

The leaves of common ſavin, a ſpecies of juniper, are much uſed by farriers for deſtroying worms in horſes.

The red wood of Bermudas Cedar, the *Juniperus Bermudiana* of Linnæus, commonly known in England by the name of cedar wood, is uſed for making pencils, as likewiſe for wainſcoting rooms, and making ſtair-caſes. It is remarkable that the worms are never found to eat the bottoms of veſſels built with this wood, as they do thoſe built with oak; ſo that for purpoſes of traffic in the Weſt-India ſeas, cedar ſhips are preferable to all others; but they are not equally fit to be employed as ſhips of war; the wood being ſo brittle as to ſplit to pieces with a cannon-ball.

The peaſants in Switzerland make torches for burning, of the wood of a mountain pine, which grows naturally in that country, and is hence denominated the torch pine.

Cedar of Lebanon is the *Pinus Cedrus* of Linnæus, and the *Larix Cedrus* of Tournefort. The truth is, that this curious tree bears the leaves of the larch; but as the fir, pine, larch, and cedar, are all arranged by Linnæus, under the genus *Pinus*, he could not, without erecting a new genus, make the cedar, in any other reſpect connected with the larch, than as they were both ſpecies of the ſame genus.

The wood of this celebrated tree, which grows naturally on Mount Libanus, in Syria, and no where elſe, is accounted proof againſt all putrefaction of animal bodies; and ſaid to yield an oil, excellent for preſerving books and writings. It is thought by Lord Bacon, to continue ſound a thouſand years.

years. The ſtatue of Diana, in the famous temple at Epheſus, is affirmed to have been of this valuable material, as was moſt of the timber-work of that wonderful ſtructure. In the temple of Apollo at Utica, there was found cedar-wood near two thouſand years old.

The largeſt cedar, mentioned by Dr. Pococke, meaſured twenty-four feet in circumference.

For particulars concerning this curious plant, the reader is referred to Pococke's, Rauwolf's, Le Brun's, and Maundrel's Travels.

The wood of a pitch-tree with an erect fruit, which the natives of Provence term *Serento*, is preferred to every other, for making violins, and other ſtringed muſical inſtruments.

CONTORTÆ, (from *con*, together, and *torqueo*, to twiſt;) twiſted plants. The name of the thirtieth order in Linnæus's Fragments of a Natural Method, conſiſting of plants which have a ſingle petal that is twiſted or bent towards one ſide.

Liſt of the Genera *contained in this Natural Order.*

SECTION I.

Plants with twiſted Flowers, having five Stamina, and one Style.

Linnæan Genera.	English Names.
Cerbera.	
Echites.	
Gardenia, — —	Cape Jaſmine.
Genipa.	
Macrocnemum.	
Nerium, — —	Oleander, or Roſe-Bay.
Periploca, — —	Virginian Silk.
Rauvolfia.	
Tabernæmontana.	
Vinca, — —	Periwinkle.

SECTION II.

Plants with twiſted Flowers, having five Stamina, and ſcarce any Style.

Apocynum, — —	Dog's-bane.

Aſclepias,

Linnæan Genera.			English Names.
Asclepias,	—	—	Swallow-wort.
Cameraria.			
Ceropegia.			
Cynanchum.			
Plumeria,	—	—	Red Jasmine.
Stapelia,	—	—	Succulent swallow-wort.

Habit and Structure of the Plants of this Order.

This order furnishes trees, shrubs, and fat succulent plants, some of which retain their leaves during the winter. The herbaceous vegetables in this order are generally perennial.

The ROOTS are sometimes branched; commonly fleshy, and garnished with fibres, or strings, like those of turnep.

The STEMS are round, and in some genera, pulpy.

The BRANCHES are sometimes placed alternate, sometimes opposite. In *cynanchum, ceropegia,* and Virginian-silk, they are twisted like those of convolvulus to the left, in a direction opposite to the apparent diurnal motion of the sun.

The BUDS are of a conic form, and naked, or without scales.

The LEAVES are sometimes alternate, sometimes placed opposite in pairs; and not seldom surround the stem in whirls. They are attached to the branches by a cylindrical foot-stalk, which is short, and frequently united to the foot-stalk of the opposite leaf. In the genus *stapelia,* which consists entirely of fat succulent plants, the leaves are nothing else than certain protuberances of a conic form, that are produced on the sides of the branches, and spread open horizontally, ending in acute points. In some other genera of this order, when the stalks are very old, the leaves become so small, as frequently to elude the sight. At the origin of the foot-stalk of the leaves, in some species of dog's-bane, and swallow-wort, are produced two or three very small *stipulæ,* or scales, on each side of the branches. Two pretty large

scales

ſcales of the ſame kind, are obſerved in ſome ſpecies of *tabernæmontana*.

The defenſive and offenſive weapons in this order are a downy ſort of pubeſcence, and ſimple, or forked prickles, which, in ſome genera, iſſue from the wings, or angles, of the leaves.

The FLOWERS are hermaphrodite, and ſtand either ſingly upon their foot-ſtalks, as in periwinkle; or are collected into umbels, and cluſters, (*corymbi*); as in *tabernæmontana*, and *cameraria*. Theſe bunches, or collections of flowers, ſometimes terminate the branches, as in red jaſmine; ſometimes proceed from the angles of the branches, or leaves, as in *tabernæmontana*, and *echites*; and ſometimes ſtand at the ſide of the wings, without iſſuing from them, as in ſwallow-wort, *ſtapelia*, Virginian-ſilk, and *cynanchum*.

The FLOWER-CUP is compoſed of one leaf divided almoſt to the baſe into five unequal ſegments which embrace each other, and are permanent; that is, accompany the ſeed-bud to its maturity.

In the genus *cerbera*, the flower-cup conſiſts of five diſtinct ſpreading ſpear-ſhaped leaves.

The COROLLA, or coloured inner cover of the flower, conſiſts of one petal, which in the different genera, is bell, ſalver, funnel, or wheel-ſhaped.

The LIMB, or upper ſpreading part of the petal, is generally divided into five equal parts, which are ſlightly bent or twiſted to the left, and embrace, or infold one another, like the petals of the mallow-tribe. *Vide* COLUMNIFERÆ.

The TUBE, or lower hollow part, is generally long, and cylindrical; ſometimes club-ſhaped, as in *cerbera*; and not ſeldom wanting, as in ſwallow wort, dog's-bane, Virginian-ſilk, and ſome others.

In ſeveral flowers of this order the petal is accompanied with a *nectarium*, which, however, in the different genera, aſſumes very different appearances. In oleander, it is a ſhort crown divided into a number of capillary ſegments, which

ſeem

ſeem rent and terminate the tube of the petal. In *ſtapelia*, it is a ſtar compoſed of five rays, with ragged points, which ſurround the organs of generation. In *echites*, and *tabernæmontana*, it conſiſts of five glands, which are placed round the *germen*, or ſeed-bud. In *cynanchum* it ſtands erect in the centre of the flower. In Virginian-ſilk, it is very ſmall, cut into five indentments, or teeth, at the brim, and ſurrounds the chaps, *faux*, of the petal. In dog's-bane, it is compoſed of five ſmall oval bodies, which riſe from the bottom of the flower, and ſurround the ſeed-bud. Laſtly, in ſwallow-wort, the *nectarium* is compoſed of five ſingular ear-ſhaped bodies, placed within the petals, from the bottom of each of which iſſues a ſharp horn, bent towards the parts of generation, and reſembling a filament without its top. Beſides this very ſingular appearance, the male and female organs are entirely eclipſed by means of a ſcaly covering which opens every way, and is termed by Linnæus, *corpuſculum truncatum*.

The STAMINA are five in number, ſhort, equal, attached at the ſame height to the tube of the petal, alternate with its diviſions, and oppoſite to thoſe of the calyx.

The ANTHERS are generally erect, and frequently approach ſo as to form a compact body in the middle of the flower. In oleander they are arrow-ſhaped, and terminated by a long thread. In dog's bane, they are divided in two at the baſe; and in *ſtapelia*, or ſucculent ſwallow-wort, they are ſlender, and faſtened on each ſide the filament.

Gardenia, and ſwallow-wort, have no filaments; in the latter the tops are inſerted into the ſcaly covering mentioned above.

The SEED-BUD is either ſingle, as in oleander, or double, as in periwinkle. In *genipa*, *gardenia*, and *macrocnemum*, it is placed below the receptacle, or ſeat of the flower. *Vide* GERMEN *inferum*.

The STYLE is wanting, or ſcarce perceptible in plants of the ſecond ſection; ſingle in thoſe of the firſt, and generally common to two ſeed-buds.

The

The STIGMA, or ſummit of the ſtyle is frequently double, as in periwinkle, and red jaſmine.

The SEED-VESSEL in ſome genera, is a pulpy fruit, of the berry and cherry kind; as in *genipa*, *rauvolfia*, and *cerbera:* but moſt frequently that ſpecies termed by Linnæus *conceptaculum*, and *folliculus*, which has one valve, or external incloſure, opens lengthways on one ſide, and has not the ſeeds faſtened to it. Two of theſe dry fruits with a ſingle cell, compoſe the ſeed-veſſel of moſt plants of this order.

The ſeed-veſſel in *gardenia*, is a dry berry; in *macrocnemum*, a capſule with two cells.

The SEEDS are generally numerous, and in ſeveral genera crowned with a long *pappus*, or downy wing, like that of the compound flowers, by means of which they eaſily diſperſe, and ſow themſelves. This down is particularly conſpicuous in dog's-bane, ſwallow-wort, *ſtapelia*, Virginian-ſilk, *echites*, and oleander.

The plants of this order being cut, emit a juice which is generally milky, as in dog's-bane; ſometimes of a greeniſh white, as in ſwallow-wort and periwinkle. From the circumſtance of their abounding in this milky juice, the greateſt part are deemed poiſonous; repeated obſervations having eſtabliſhed this aphoriſm, that milky plants, except thoſe of the plain compound flowers, as the dandelion, and nipple-wort, are generally of a baneful deſtructive nature, and ought, at leaſt, to be adminiſtered with caution. The moſt dangerous plants in this order are thoſe of the followlowing genera, *rauvolfia*, *cerbera*, red-jaſmine, *tabernæmontana*, Virginian-ſilk, dog's-bane, *cynanchum*, and *ceropegia*.

With reſpect to their ſenſible qualities, they are bitter, particularly the ſeeds, roots, and bark, in which reſides their principal virtue. An infuſion of any of theſe parts in cold water, taken in very ſmall quantity, is innocent, and purgative; if the doſe is augmented, it becomes emetic; and if ſtill increaſed, mortal.

The milky juice which flows from the ſtalks and leaves of all the ſpecies of dog's-bane, is ſuppoſed to be hurtful, if

taken

taken inwardly; but does not raife bliſters on the ſkin, as the juice of ſpurge, and other acrid plants. The down, or cotton, which ſurrounds the ſeed, is uſed in France for the ſtuffing of eaſy chairs, and making quilts, which being extremely light and warm, are a very proper covering for perſons afflicted with the gout.

A ſpecies of *Aſclepias*, commonly termed Egyptian dog's-bane with flowers growing in a ſpike, probably the *aſclepias gigantea* of Linnæus, grows plentifully near Alexandria, and produces a cotton or down which is uſed as fur, to adorn the robes of perſons of quality. The leaves of this plant, ſays Lemery, being ſtamped, and applied as a cataplaſm, are reckoned proper to reſolve cold tumours. The juice makes the hair come off; and, uſed externally, is a remedy for diſorders of the ſkin; but given inwardly, is a poiſon: for it purges with ſuch ſharpneſs and violence, as to cauſe bloody-fluxes that prove mortal. The leaves are a poiſon to dogs, wolves, ſheep, and other animals.

Common ſwallow-wort, another ſpecies of *Aſclepias*, which, from its ſuppoſed virtue, has obtained the names of *vincetoxicum*, Le Domte-venin, vincetoſſico, and tame-poiſon, all expreſſive of an imagined alexipharmic quality, is a perennial herb, which grows plentifully on ſandy mountains, and in the clefts of rocks in moſt parts of Europe; but, though a native of Sweden a more northerly climate, (as Linnæus particularly atteſts) has not yet, as far I can learn, been diſcovered to be an indigenous production of any part of Britain. The roots are acrid and bitter to the taſte, and though by many eſteemed, as the names juſt mentioned import, an excellent counterpoiſon, yet want not ſuſpicious marks of a very oppoſite and noxious quality. The freſh-gathered roots ſo much reſemble in their effects thoſe of apocynum, or common dog's-bane, that, according to Haller, they provoke vomiting. Linnæus likewiſe affirms, in his *Materia Medica*, that the roots of ſwallow-wort are poiſonous in a ſmall degree. By many they were much commended for their ſingular efficacy in promoting ſweats, and for other properties in various diſeaſes, particularly in malignant fevers, in which, the decoction of an

 ounce

ounce in a pint of common water, was accounted to be preferable to ſcorzonera.—But as there are medicines which, in all ſuch caſes, may very properly be adminiſtered, and with, at leaſt, an equal chance of ſucceſs, it would, perhaps, be better, unleſs under the guidance of ſuperlative medical ability, to abſtain altogether from thoſe ſuſpected roots.—The plant, when froſt-bitten, is fed upon by horſes; at other times they refuſe it.

Greater Syrian dog's-bane, the *Apocynum Syriacum* of Cluſius, the *Aſclepias Syriaca* of Linnæus, is a biennial or perennial herb, which grows naturally in Syria and Egypt, as likewiſe in Virginia, and ſome other parts of North America. The white ſilky or downy ſubſtance which crowns the ſeeds, M. La Rouviere, an ingenious Frenchman of the laſt century, diſcovered the ſecret of ſpinning into regular balls like thoſe of ſilk; and in conſequence of his uſeful invention, obtained a patent or decree of council from the then French government, authorizing him to fabricate from this new prepared ſubſtance, velvets, flannels, and other ſtuffs.

The falſe or baſtard ipecacuanha, a poiſonous root brought out of America for the true ipecacuanha, and ſometimes unhappily adminiſtered as ſuch, is the root of a ſpecies of ſwallow-wort, termed by Linnæus, *aſclepias curaſſavica.* The two roots, however, may be eaſily diſtinguiſhed; that of the baſtard kind is compoſed of a great number of ſmall fibres; whereas the true plant of that name has jointed fleſhy roots, which run deep into the ground.

The wood of the ahouai, a ſpecies of *cerbera*, which grows naturally in Brazil, and the Spaniſh Weſt-Indies, ſtinks moſt abominably; and the ſeeds, or kernels, are a ſtrong emetic poiſon. The Indians know of no antidote to expel this poiſon, and are ſo cautious, that they never uſe the wood of the tree for fuel. The ſtones (for the fruit is of the cherry kind,) they employ in their dances to make a gingling ſound, like the ſmall ſhells of ivory, or hard wood, termed caſtanets, or ſnappers, uſed for the ſame purpoſe by dancers of sarabands in Spain, and other parts of Europe.

Another ſpecies of *Cerbera*, which grows plentifully in the

the Eaſt Indies, and is termed by Linnæus, after Bauhin and Ray, *Cerbera Manghas*, abounds with a cauſtic milk, which, notwithſtanding, if properly prepared, proves, ſays Burman, an excellent medicine in dropſical caſes, in which it operates both as an emetic and cathartic. The leaves of this plant are like thoſe of oleander; the flowers have the appearance and fragrance of jeſſamine; the fruit, in ſhape, reſembles a peach, and in colour, an orange.

Round-leaved Montpelier ſcammony, a ſpecies of *cynanchum*, abounds with a milky juice, which is of a purgative nature, and when concreted, has been frequently ſold for true Aleppo ſcammony.

All the ſpecies of roſe-bay, or oleander, are ſuppoſed to have a poiſonous quality; the larger branches, when burnt, emit a very diſagreeable ſmell, which generally indicates ſomething noxious. Galen relates, that the common oleander, taken internally, is deadly; and ſome late obſervations have evinced, that the water in which the leaves are macerated, is a mortal poiſon to ſheep. Notwithſtanding theſe facts, more noxious qualities have been aſcribed to this genus of plants than fall to its ſhare. The honey about Trebiſond is reckoned very unwholeſome; occaſioned, as ſome ſuppoſe, by the bees extracting it from the flowers of the oleander: but this is entirely a miſtake; for, Tournefort has fully informed us, that it is not from the flowers of oleander, but from thoſe of a ſpecies of chamærhododendros, the *azalea pontica* of Linnæus, that the noxious juice in queſtion is extracted.

Xenophon having related, in the fourth book of the Expedition of the younger Cyrus, that, "on the march of the Greeks from Upper Aſia, ſuch of the army as partook of the honey in a place near *Trapezus*, now Trebiſond, on the Euxine, where there was a great number of bee-hives, were affected with very diſagreeable ſymptoms, ſuch as vomiting, purging, and even inſanity; that not one was able to ſtand erect; that thoſe who had indulged but little in this pernicious dainty, ſeemed intoxicated; whilſt ſuch as had been more liberal in the uſe of it, either appeared frantic, or lay as dead; and that, in ſhort, though, about the ſame hour in the following

following day, they had a partial recovery of their ſenſes, they were not, however, completely reſtored till ſome days after:"—M. Tournefort, in his Travels through the Leſſer Aſia, and eſpecially Pontus, the ſcene of this tranſaction, was led to pay particular attention to the narrative of the Greek Hiſtorian, and finding, upon minute enquiry, that the plant mentioned above, which he denominates *Chamærhododendros pontica, maxima, meſpili folio, flore luteo*, and which grows plentifully about Trebiſond, and the vicinity, produces the very effects related by Xenophon, and that violent head-achs are occaſioned even by its ſmell, he concludes, with the greateſt probability of truth, that the honey which proved ſo noxious a refreſhment to the Greek army, had been extracted by the bees from the plant in queſtion; and, in corroboration of his concluſion, adduces the teſtimony of Father Lamberti, a Miſſionary, who obſerves, that the honey collected by the bees from a certain ſhrub, which, from the deſcription given of it by Lamberti, Tournefort pronounces to be the medlar-leaved *Chamærhododendros*, and which grows commonly in *Colchis* or Mingrelia, a country adjoining to Pontus, is highly pernicious, and, in particular, excites vomiting. It is added by the Reverend Father, that the ſmell of the flowers of this ſhrub bears a great reſemblance to that of honey-ſuckle, but is much ſtronger. Memoires de l'Academie Royale des Sciences, 1704.

Dr. Haſſelquiſt, in his Travels to the Eaſt, ſpeaking of oleander, which grows in great abundance in Egypt and the Eaſtern countries, mentions not one ſuſpicious character, but aſſerts, on the contrary, that it poſſeſſes all the qualities of the tree of the righteous, commemorated by David in the firſt pſalm.

The bark of a ſpecies of Malabar oleander, termed codagapala by the natives, is mentioned by Adanſon, as a ſpecific in violent dyſenteries.

The milky juice of all the ſpecies of red jaſmine, (*Plumeria,*) is extremely cauſtic. If, in cutting off any of the branches of theſe plants, the knife is not immediately cleaned, the juice will ſuddenly corrode it, and in a very little

time,

time, turn the blade almoſt black. The ſame ſubſtance dropped on linen, has the effect of the ſtrongeſt aqua-fortis.

The powdered bark of a ſpecies of African ſwallow-wort, termed by the natives *beidelſar*, mixed with charcoal of the ſame root, is an excellent cauſtic. An infuſion in cold water of this root is employed with ſucceſs againſt the bites of ſerpents, and other venomous creatures.

The tender ſhoots of *Aſclepias Syrica*, notwithſtanding the ſuſpicious nature of the plant, are ſometimes uſed for the kitchen, and prepared like Aſparagus. From the flowers, the French, when in poſſeſſion of Canada, where it grows in great abundance, extracted a ſugary ſubſtance, of a brown colour, and affirmed by Kalm to be very agreeable to the taſte. Theſe flowers, when in full bloom, impregnate the air with their fragrant exhalations, and render walking or travelling in the woods, eſpecially in the evening, peculiarly delightful. For the purpoſe of making the ſugar juſt mentioned, they muſt be gathered in the morning, when they are covered over with dew.

The milky juice of *Apocynum Andrœſæmifolium*, is ſaid to be noxious to ſome perſons, and harmleſs to others, a quality which has likewiſe been aſcribed to the *Rhus Vanix*, or poiſon-aſh. "I ſaw a ſoldier," ſays Kalm, in his Travels into North America, "whoſe hands were bliſtered all over, merely by plucking the plant in order to ſhew it me; and its exhalations, it is affirmed, affect ſome people when they come within reach of them. As for my part," he continues, "it has never hurt me, though, in preſence of ſeveral people, I have touched the plant, and rubbed my hands with the juice till they were white all over; and I have often rubbed the plant in my hands till it was quite cruſhed, without feeling the leaſt inconvenience. In general, however, the lacteſcent juice of this plant not only ſwells any part of the body on which it is ſpread, but frequently corrodes the ſkin."

Of the filaments of the ſtalk of *Apocynum Cannabinum*, the North American Indians make ropes, which they employ as bridles, and for fiſhing-nets. Theſe ropes are ſaid to be

 ſtronger,

ſtronger, and to keep longer in water, than ſuch as are made of common hemp. "On my journey," ſays Kalm, "through the country of the Iroquois, I ſaw the women employed in manufacturing this hemp. They made uſe neither of ſpinning wheels nor diſtaffs, but rolled the filaments upon their bare thighs, and made thread and ſtrings of them, which they dyed red, yellow, black, and of other colours, and afterwards worked them into ſtuffs, with conſiderable ingenuity." Sometimes the fiſhing tackle of the Indians conſiſts entirely of this hemp.

CONUS, (Gr. Κωνος,) a cone. A ſpecies of fruit or ſcaly ſeed-veſſel ſo termed by Tournefort, and other botaniſts. Linnæus has ſubſtituted STROBILUS in its place, which ſee.

CORCULUM, (a diminutive from *cor*, the heart); a little heart. The eſſence of a ſeed, and principle of life of the future plant, attached to and contained within the lobes. It conſiſts of two parts, termed by Linnæus *Plumula* and *Roſtellum*. The former is the *radicula* of Grew and other naturaliſts. *Vide* PLUMULA, and ROSTELLUM.

The *Corculum* is, in fact, the embryo of the future vegetable; and is attached by two trunks of veſſels to the lobes at their union. The firſt of its two parts mounts upwards, and becomes the trunk. The other ſtrikes into the ground, and is the rudiment of the root. The lobes and heart of the ſeed are diſtinctly viſible in the bean, and other ſeeds of that claſs, eſpecially after remaining ſome time in water, or earth. *Vide* COTYLEDONES, and GERMINATIO.

The principle of life is ſeated either at the ſummit or baſe of the ſeed. From this circumſtance are conſtructed the two firſt claſſes in Cæſalpinus's Method, containing trees and ſhrubs only.

COROLLA, (diminutive from *corona*, a crown); a little crown, chaplet, garland, or wreath:—Linnæus's name for the beautiful coloured leaves of the flower, which ſtand within the calyx, and are ſupported by it.

This conſpicuous and principal part of the fructification is defined to be the expanſion, or continuation, of the fine

inner bark of the plant, and confifts of two parts, the petal, and *nectarium*; the laft of which, however, is rather a ftriking fuperfluity, or occafional appendage, than a neceffary part of every flower.

The petals, fays Tournefort, are thofe leaves which generally excel the other parts of the plant in beauty, and colour, and never, like the flower-cup, become a cover or veffel to the feed.

Thefe characters ferve in moft cafes to diftinguifh the *corolla* from the *calyx*; but the petals, as in paffion-flower, are not always coloured; and the tube of the petal, in the genus *felago*, inclofes, or involves, the feed. In fuch doubtful cafes as thefe, we muft have recourfe to a more certain mark of diftinction; and it is this. The petals, and ftamina, are always ranged alternately; the divifions of the calyx and ftamina are placed oppofite. This rule determines with precifion in fuch flowers as want either the calyx, or petals. Thus, in pellitory, wild orach, and nettle, one of the two covers is wanting. Which is it? Am I to infer that the fingle cover prefent is the *corolla*, becaufe the finer and more principal part? Nothing would be more erroneous than fuch an inference; many flowers, as water-purflane, *ruellia*, and bell-flower, which generally have both covers, are found occafionally to lofe the petals, but never the calyx. How then am I to proceed? Apply the rule mentioned above. I do fo, and finding the divifions of the only cover that is prefent, to ftand oppofite to the ftamina, I conclude that cover to be the calyx.

That the rule juft mentioned is founded in the natural fituation of the parts in queftion will appear, by examining any number of complete flowers in the fourth and fifth claffes of Linnæus's Sexual Method. In the former of thefe claffes, the number four, in the other, the number five, is predominant; and, as both covers are prefent, the oppofition and alternation alluded to, become diftinctly vifible.

The petal, which, as we have faid, conftitutes the principal part of the corolla, furrounds both organs of generation;

ration; and confifts either of one piece, as in lily of the valley; or of many, as in the tulip. In the firft cafe, it is called a monopetalous corolla; in the fecond, polypetalous, from the Greek numerals, μονος, *folus*, *unicus*, fingle, and πολυς, *multus*, many, compounded with *petal*, a word of the fame origin. A flower which has no petals, is termed by botanifts, apetalous. *Vide* APETALUS *Flos*.

The lower hollow part of a corolla of one petal is called the tube; the upper fpreading part, the limb; the opening of the tube, the chaps, or jaws, *(faux.)*

A bell-fhaped flower, *corolla campanulata*, (*campana*, a bell,) confifts of one petal, which is regular, hollow like a bell, and nearly of the fame width throughout. Of this kind are bind-weed, deadly night-fhade, dog's-bane, and bell-flower. Linnæus affirms, that the bell-fhaped petal wants the tube. I fhould rather be inclined to affert, that it wants the limb, or upper fpreading part; for if tube means any thing, it muft mean fomething hollow.

A funnel-fhaped flower, *corolla infundibuliformis*, (*infundibulum*, a funnel,) has one regular petal, whofe limb is fhaped like a cone, and rifes from a long tube. Tobacco, oleander, thorn-apple, and hen-bane, furnifh examples.

A falver-fhaped flower, *corolla hypocrateriformis*, (ὑπο, *fub*, under, and Κρατηρ, *crater*, a bowl, goblet, or cup,) has a plain, or flat fpreading limb ftanding on a fhort tube, as in periwinkle, baftard lychnis, and *androface*.

A wheel-fhaped flower, *corolla rotata*, (*rota*, a wheel,) confifts of a fingle regular petal, which, like the former, has a flat, or plain limb, but wants the tube altogether. This is exemplified in borage, loofe-ftrife, pimpernel, and mullein.

A gaping-flower, *corolla ringens*, confifts of one irregular petal, fhaped fometimes like a mafque, as in birth-wort, and fometimes terminated by a tube below, and divided into two lips above; as in lion's-tail, and dead nettle. The gap, or opening between the two lips, is termed by Linnæus, *rictus*, a gaping, or grinning. The upper-lip is wanting in germander.

Moft

Moſt of the flowers in the claſs *Didynamia* of Linnæus are of the gaping kind.

The lower tapering part of each petal, in a flower conſiſting of many petals, is termed the claw, *unguis*; the upper ſpreading part, the *lamina*.

A croſs-ſhaped flower, *corolla cruciformis*, (*crux*, a croſs,) conſiſts of four petals that are nearly equal, and ſpread at top upon claws the length of the calyx, in form of a croſs. It is exemplified in ſtock gilly-flower, moon-wort, lady's-ſmock, candy-tuft, and the other flowers of the claſs *Tetradynamia* of Linnæus.

A pea-bloom, or butterfly ſhaped flower, *corolla papilionacea*, (*papilio*, a butter-fly,) is compoſed of four or five irregular petals; the uppermoſt of which reſembling a ſtandard, is, for that reaſon, termed *vexillum*; the lowermoſt, ſometimes divided in two, reſembles the keel of a ſhip, and is hence called *carina*; the two ſide petals, termed *alæ*, or wings, ſtand ſingle, involve the keel, and are generally furniſhed at their origin with two appendages reſembling ears.

The term is exemplified in pea, lupin, vetch, laburnum, and the other flowers in the claſs *Diadelphia* of Linnæus. Theſe flowers, from the nature of their fruit, were long denominated leguminous. Cordus was the firſt who diſtinguiſhed them by the name of papilionaceous, from their obvious reſemblance to a butter-fly.

Laſtly, an irregular flower properly ſo called, conſiſts of ſeveral irregular and diſſimilar petals, which are generally accompanied with a *nectarium*. Of this kind are the aconite, violet, fumatory, lark-ſpur, bee-flower, orchis, fraxinella, balſam, and ſome others.

The number of petals is determined from the baſe of the corolla; the number of ſegments, or diviſions, from the middle of the limb, or upper ſpreading part of the petal. Rivinus's rule on this head, is to reckon as many petals, as the parts into which the flower when it falls, reſolves itſelf. By this criterion, which ſeems, in general, to be very exact, are the flowers of wood-ſorrel, ſpeedwell, pimpernel, wild-roſemary, and *trientalis*, diſcovered to conſiſt of one petal,

petal, though the divifions are fo deep, and flightly connected, that they affume the appearance of fo many diftinct petals.——Exception. The flower of *Vaccinium Oxycoccus* is refolved into four diftinct leaves, which formerly were one.

Tournefort reckons the flowers of the mallow-tribe monopetalous: Linnæus, pentapetalous.

Of polypetalous flowers, fome confift of two petals, as enchanter's night-fhade, (*circæa*) and *commelina*; fome have three, as Virginian fpider-wort, and water-foldier; fome four, as ftock gilly-flower, and the other crofs-fhaped flowers; fome five, as marfh-marigold, pæony, and the umbelliferous flowers; others fix, as tulip, lily, and May-apple; fome nine, as tulip-tree, and a fpecies of tea according to Dr. Hill; and fome confift of an indefinite number, as water-lily, and globe ranunculus.

Segments, or divifions, are very frequent in flowers of one petal, which generally have their limb, or upper fpreading part, cut into five. In flowers that have more than one petal, thefe divifions are more rarely to be found. The following are among the moft remarkable inftances of this kind; chick-weed, and enchanter's night fhade, have each petal divided in two; *holofteum*, and *hypecoum*, in three; campion, in four; and baftard-rocket, in five.

In refpect to figure, the petals are either waved, as in fuperb lily; plaited, as in bind-weed; rolled, or turned back, as in fow-bread, and climbing African afparagus; or twifted and bent to one fide, as in fwallow-wort, oleander, periwinkle, Virginian-filk, and the other genera of the natural order *Contortæ*. *Vide* CONTORTÆ.

In *Trientalis*, the petals lie over one another like tiles; one fide of each folding over the next towards the right. In gentian, the petals, before they are unfolded, lie over each other in a direction contrary to the fun.

In refpect to equality, the petals and fegments are either equal, when the parts are regular and equal in figure, magnitude, and proportion, as in primrofe, *limofella*, privet, lilac, and jeffamine; unequal, when the parts anfwer in proportion,

portion, but not in magnitude, as in flowering-rush; or irregular, when the parts of the limb differ in figure, magnitude, or proportion, as in aconite, lupine, and dead-nettle.

The margin, or brim of the petals, is either sawed, as in linden-tree, and water plantain; beautifully fringed, as in buck-bean, rue, and Indian cress; notched, *crenata*, as in flax; jagged, or indented at the bottom of each division, as in round leaved water pimpernel, and iron-wood; or covered with a fine downy hair, as in buck-bean, and a species of St. John's-wort.

In lily, thorn, and *brunsfelsia*, the corolla is very long; in *centunculus*, and currant-tree, very short.

The base of the corolla is generally placed close to the flower-cup; in a very few genera, as marvel of Peru, tuberous moschatel, and greater wild burnet, the seed-bud is interjected betwixt them.

With respect to duration, the petals sometimes fall off immediately after their expansion, as in herb-christopher, and meadow-rue; sometimes wither on the stalk without dropping, as in bell-flower, orchis, cucumber, gourd, and bryony; sometimes continue till the fruit has attained maturity, as in water-lily; but most commonly fall off with the stamina, and other parts of the flower, before the ripening of the fruit.

In all the plants where the calyx makes no part of the seed-bud, but is separated from it, the corolla, when attached to the former, consists of several distinct pieces; and the calyx is always of one leaf.

This aphorism being previously established, serves to ascertain the insertion of the corolla in plants, where, as in the rose, apple, and medlar, the calyx makes part of the seed-bud, and it is impossible to decide by the eye, whether the corolla is attached to the calyx, or the common receptacle. In such cases we must be guided by analogy; and if the flower consists of many petals, conclude that they are inserted, each by its claw, into the calyx; if of one petal only, into the common receptacle.

Among the most striking singularities in the situation of the

the petals, may be reckoned that of eriocaulon, in which the corolla, as well as calyx, are placed under the feed-bud.

In affimilating the animal and vegetable kingdoms, Linnæus diftinguifhes the corolla by the name of *aulaeum floris*, (or curtains of the bed) in which the nuptials of the plant are celebrated. *Vide Phil. Bot.* p. 92.

In the different fpecies of winter-green, tobacco, gentian, fpeedwell, geranium, hyacinth, narciffus, fcabious, primrofe, buck-bean, andromeda, and whortle-berries, the petals differ confiderably in point of figure.

Nor is this part of the flower, in plants of the fame genus, more certain, with refpect to number; fome fpecies of ranunculus, and hellebore, have five petals; others, an indefinite number; fea-pink has generally five petals; a particular fpecies has only one; fome fpecies of fumatory have two; others, four petals. In caffava, and papaw, two exotic plants, a variation, in point of number, is obferved in the fame fpecies.

Thefe varieties of the petals, with refpect to figure and number, afford no defpicable marks of diftinction in difcriminating the fpecies; although it muft be acknowledged, that being derived from a principal part of fructification, fuch characters ought not, in ftrict propriety, to be employed. Marks of this kind, however, are frequently made ufe of by Linnæus, though in direct contradiction to his own principles, which eftablifh, that the characters of the fpecies ought to be taken from the parts that are totally unconnected with thofe of fructification.

In gentian, fays Linnæus after the learned Haller, the fpecies cannot be diftinguifhed, without calling in the affiftance of the flower, which is fubject to confiderable variations, being either bell, funnel, or wheel-fhaped, and cut into four, five, or eight fegments.

The African geraniums are diftinguifhed from the European plants of the fame genus, not more remarkably by the union of the ftamina, than by the irregularity of the petals.

From luxuriancy of nourifhment, the petals are more fubject to change, and confequently lefs to be depended upon,

upon, than either the ſtamina, or calyx. Hence their multiplication in double flowers, which, though, in effect, ſo many monſters in the vegetable kingdom, attract the ſole attention of the floriſt, and furniſh ſuch exquiſite pleaſure by the beautiful variety of their colours. *Vide* PLENUS *Flos*, and MULTIPLICATUS *Flos*.

For a deſcription of the ſtructure, and ſingularities of the other occaſional appendage of the corolla, called by Linnæus, NECTARIUM, ſee the term itſelf.

COROLLISTÆ, from *corolla*. By this name Linnæus diſtinguiſhes thoſe ſyſtematic botaniſts, who have arranged vegetables from the regularity, figure, number, and other circumſtances of the petals, or coloured leaves of the flower.

The beſt ſyſtems of this kind are thoſe of Rivinus, and Tournefort. The former proceeds upon the regularity and number of the petals; the latter, with much more certainty, on their regularity and figure.

Rivinus's object was to find an eaſy, not a natural method; accordingly his ſyſtem is the moſt regular, I mean, deviates the leaſt from the principle with which he ſets out, of any that has yet been publiſhed.

The authors who have followed his method are,

Koenig, a German, in his ſecond part of the Vegetable Kingdom, publiſhed at Baſil, in 4to. in 1696.

Welſch, in his Baſis Botanica, publiſhed at Leipſic, in 1697.

Heucher, Profeſſor of Botany at Wittenberg, in his Hortus Wittembergenſis, publiſhed in 1711.

Ruppius, in his Flora Jenenſis, publiſhed in 1718. This ingenious botaniſt improved greatly upon Rivinus's Method, particularly in his arrangement of the compound flowers.

Chriſtian Knaut, in his Methodus Plantarum Genuina, publiſhed at Halle, in Saxony, in 1716. Knaut's method is that of Rivinus inverſed; the number of petals, not their regularity, being the leading principle. This botaniſt, among other dogmas equally ſingular, affirmed that all flowers are furniſhed with petals; and all ſeeds with a covering or veſſel.

Gemeinhart, a German, in his Catalogus Plantarum circa Laubam, publiſhed in 1725.

Kramer, a German, in his Tentamen Botanicum, publiſhed at Dreſden in 1726, and reprinted at Vienna, in 1744.

Hebenſtreit, Profeſſor of Botany at Leipſic, in a work entitled, Diſſertationes ac Definitiones Plantarum, publiſhed at Leipſic, in 1731.

Ludwig, in his Definitiones Plantarum, publiſhed at Leipſic, in 1737. The claſſes in Ludwig's Method are thoſe of Rivinus. The orders or ſecondary diviſions are taken from Linnæus's Sexual Syſtem.

Wedel, in his Tentamen Botanicum, publiſhed in 1747.

M. Boehmer, in his Flora Lipſiæ indigena, publiſhed at Leipſic, in 1750.

The two laſt are profeſſed followers of Ludwig's Method.

Laſtly, Sigeſbeck, in his Botanoſophiæ verioris ſciagraphia, publiſhed at Peterſburg, in 1737.

Among the numerous authors who have followed the ingenious and accurate method of the celebrated Tournefort, are the following:

Sherard, an Engliſhman, who, in 1689, publiſhed at Amſterdam, a rude draught of Tournefort's Method, under the title of Schola Botanices. In this work, the plants are arranged according to the order of the Royal Garden at Paris.

Father Plumier, in his Nova Genera Plantarum Americanarum, publiſhed at Paris, in 4to, in 1705.

Falugi, an Italian, who deſcribed, in very elegant Latin verſe, all the genera of Tournefort, in a work intitled Proſopopœiæ Botanicæ, publiſhed at Florence, in 1705.

Marchant, Dodart, Niſſole, Juſſieu, and Vaillant, in the Memoirs of the Academy of Sciences at Paris, from 1700, to 1740.

Johren, a German, in his Vade Mecum Botanicum, publiſhed in 1710.

Barrelier and Feuillé, in 1714.

Valentine, a German, in his Tournefortius Contractus, publiſhed at Francfort, in 1715.

Ripa, an Italian, in a work entitled Hiſtoriæ univerſalis Plantarum conſcribendi propoſitum, publiſhed at Pavia, in 1718.

Dillenius, in 1719, in his Flora Giſſenſis.

Pontedera, in 1720.

Monti, in a work entitled Indices Plantarum varii, printed at Bologna, in 1724.

Micheli, in 1729.

Fabricius, a German, in a work entitled Primitiæ Floræ Butisſbacenſis, publiſhed in 1743.

Sabbati, in his Synopſis Plantarum circa Romam naſcentium, publiſhed in 1745.

Alſton, Profeſſor of Botany at Edinburgh, in his Tyrocinium Botanicum, publiſhed at Edinburgh, in 1753. To this work is prefixed a learned and ſenſible diſſertation, containing, amongſt other important doctrines, a comparative view of the reſpective merits of Tournefort and Linnæus.

To theſe may be added the immortal Boerhaave, who, deſirous to have a principal eye in his method, to the conſideration of the fruit, combined, in ſome meaſure, the different methods of Ray, Hermannus, and Tournefort.

Bernard de Juſſieu, a pupil of Tournefort's, is alſo a follower of his maſter's method.

COROLLULA, a diminutive from *corolla*, a little wreath, or crown. The name given by Linnæus to the partial petals or florets in a compound flower. Theſe are the *floſculi*, and *ſemifloſculi* of Tournefort. *Vide* COMPOSITSUS *Flos*, and SYNGENESIA.

CORONA, a crown. The name given by ſome botaniſts, to the circumference or margin of a radiated compound flower. It correſponds to the *Radius* of Linnæus, and is exemplified in the flat tongue-ſhaped petals which occupy the margin of the daiſy, and ſun-flower.

CORONA *Seminis*. *Vide* CORONULA.

CORONARIÆ, from *corona*, a wreath, chaplet, or garland.

The tenth order of plants in Linnæus's Fragments of a Natural Method. Under this name, inſtead of the more obvious

obvious one *liliaceæ*, Linnæus collects a great number of Genera, most of which furnish very beautiful garden flowers, proper for being formed into a garland, or floral crown, (*corona florea*, *Plaut.*)

List of the Genera *contained in this Natural Order.*

SECTION I.

Liliaceous Plants with a bulbous Root.

Linnæan Genera.			*English Names.*
Albuca,	—	—	Bastard-Star of Bethlehem.
Cyanella.			
Fritillaria,	—	—	Fritillary, and Crown Imperial.
Helonias.			
Hyacinthus,	—	—	Hyacinth.
Hypoxis.			
Lilium,	—	—	Lily.
Melanthium,	—	—	Star-Flower.
Ornithogalum,	—	—	Star of Bethlehem.
Scilla,	—	—	Squill.
Tulipa,	—	—	Tulip.

SECTION II.

Liliaceous Plants with fibrous, and tuberous or fleshy Roots.

Agave,	—	—	American Aloe.
Aletris,	—	—	Bastard Aloe.
Aloe,	—	—	Aloe.
Anthericum,	—	—	Spider-wort.
Asphodelus,	—	—	Asphodel, or King's-spear.
Bromelia,	—	—	Ananas, or Pine-apple.
Burmannia.			
Hemerocallis,	—	—	Day Lily, or Lily Asphodel.
Polianthes,	—	—	Tuberose.
Tillandsia.			
Veratrum,	—	—	White Hellebore.
Yucca,	—	—	Adam's Needle.

Habit

Habit and Structure of the Plants of this Order.

Thefe plants are herbaceous and perennial, and from one inch to fifteen feet high. A low-growing fpecies of fpider-wort is annual.

The ROOTS are bulbous in plants of the firft fection; *Vide* BULBUS; fibrous, and compofed of fmall flefhy knots, which are jointed at the top, in thofe of the fecond.

The bulbs in queftion, either confift of fcales laid over each other like tiles, as in lily, hyacinth, ftar of Bethlehem; or are folid, that is, have no fcales, as in tulip.

The STEM of the liliaceous bulbous plants, is properly wanting; what fupplies its place being nothing elfe than the bafe of the leaves, which wrapping, or enfolding each other, form at bottom a roundifh flefhy bulb, hitherto diftinguifhed, though perhaps improperly, by the name of root. In the other plants of this order, the ftem is fimple, that is, has few branches, and is either furnifhed with leaves, as in ftar-flower; or rifes naked, as in moft of the afphodels, and aloes.

Note. A naked ftem arifing immediately from the root, is termed by Linnæus, *fcapus*. *Vide* SCAPUS.

The genus *tillandfia* has a graffy ftalk. *Vide* CULMUS.

The BRANCHES are alternate, and cylindrical.

The LEAVES are fimple, alternate, and undivided. Thofe which are next the root, termed *radical leaves*, generally form at their origin a fheath, which, in a great number, as tulip, fpider-wort, white hellebore, afphodel, aloe, and hypoxis, is entire; that is, goes all round; whilft in others, as the lily, crown imperial, American aloe, tuberofe, and fquill, it is cleft, or divided longitudinally on one fide. In lily, and crown imperial, fome of the leaves are placed oppofite, and fome even in whirls round the ftem.

The flowers are univerfally hermaphrodite, except in white hellebore, which has both male and hermaphrodite flowers mixed together on the fame root.

The mode of inflorefcence, or manner of flowering, in this order, is various. In tulip, the flowers are fingle, and terminate the ftem; in lily, ftar of Bethlehem, and fquill, they form a fpike; in crown imperial, an umbel; and in

Adam's needle, and white hellebore, a panicle, or diffused spike. *Vide* SPICA, UMBELLA, and PANICULA.

The CALYX, or flower-cup, in this order, according to Linnæus, is generally wanting. In strict propriety, however, the single cover that is present in most of these plants, though beautifully coloured, ought to be denominated a calyx; as its divisions, generally six in number, are placed opposite to the stamina. See the article COROLLA.

In pine-apple, tillandsia, and burmannia, which have both covers, the calyx is of one piece deeply divided into three segments.

The PETALS, or, to speak more properly, the coloured leaves of the flower, are in number from one to six. Plants which, like asphodel and tuberose, have a single petal, have the limb, or upper part, split into six divisions. Burmannia, and pine-apple, have three petals.

The petals in some species of lily, as the martagon, are rolled, or turned back.

The NECTARIUM in this order is various: in the lily it is a longitudinal line, or furrow, which runs through each petal, and reaches from the base to the middle. In crown imperial, it is a small hollow, or pore, formed at the base of each petal; in asphodel, it consists of six very small valves, which approaching, form a globe, and are inserted into the base of the petal; in hyacinth, it is composed of three melliferous pores, situated on the top of the seed-bud. In pine-apple, it is a small scale lying within the substance of each petal, above the base; and in bastard star of Bethlehem, *albuca*, it consists of two sharp pointed bodies, proceeding from the furrows of the seed-bud, and covered by the broader base of the three fertile filaments.

In some species of lily, the nectarium is hairy; in others, it is naked.

The STAMINA, or threads, are six in number, erect, and inserted into the common receptacle, if the flower consists of many petals; into the tube, or divisions of the corolla, if of one. In asphodel, the filaments are bent like a bow, alternately long and short, awl-shaped and attached

tached to the valves of the nectarium. The termination of the filament, in some species of star of Bethlehem, is alternately divided in three; the middle segment supporting the anther. Five species of spider-wort have hairy, or downy filaments. In the genus *albuca*, the stamina are alternately barren, or castrated, that is, want the anthers; and in Adam's needle, the filaments are bent backwards.

The ANTHERS, or tops, are long, commonly divided below, and slightly attached by their sides to the filaments on which they turn like a vane, or the needle of a compass.

The SEED-BUD is single, and placed either within the flower-cup, as in the greatest number; or below it, as in pine-apple, hypoxis, and American aloe.

The STYLE is single, thread-shaped, and generally of the length of the petals. The tulip, and Adam's needle, have no style. In white hellebore, there are three seed-buds, which end in the same number of styles.

The STIGMA, or summit of the style, is generally single, of a conic form, and shaggy or hairy at the extremity. Burmannia, and white hellebore, have three summits.

The SEED-VESSEL is generally a capsule; divided externally into three valves, internally into three cells.

The fruit of the pine-apple is of the nature of a berry.

White hellebore has three capsules, each of which has a single cell, and valves.

The SEEDS are numerous, flat, or round, and generally placed in two rows. In aloe, spider-wort, and asphodel, they are angular. Hyacinth has only two roundish seeds.

With respect to the powers of the plants of this order, it may be affirmed, in general, that such as have little taste, or smell, as the roots of tulip, and star of Bethlehem, are perfectly innocent; whilst those which have a heavy, nauseous smell, as squill, hyacinth, crown-imperial, and spider-wort, are, at least, suspicious, and frequently prove noxious.

The aloe, and American aloe, which by former botanists had been conjoined, on account of their conformity in point of habit, are ranged as distinct genera by Linnæus, principally from this circumstance, that in the former, the seed-

 bud

bud is placed within the petal, or flower; in the latter, below it. We may mention alſo another difference in the growth of the plants, by which they may be diſtinguiſhed before they flower. In American aloe, the flower-ſtem is produced from the centre of the radical leaves; and as theſe are cloſely folded over each other, it is evident that, until they are fully expanded, the ſtem is not at liberty to advance. Hence the common opinion, that theſe plants do not flower till they are a hundred years old, when the flower-ſtem riſes out of the centre of the leaves, produces its flowers, and, with the reſt of the plant, quickly dies. The time of its flowering, however, is not limited, but depends upon the growth of the plant, which is particularly affected by heat and cold.

In aloe, the flower-ſtem is produced on one ſide of the heart or centre of the plant, ſo riſes annually; the leaves too are always more expanded than thoſe of American aloe.

The mitre-ſhaped aloe, ſo termed from the figure of its leaves, is a kind of ſymbolic plant to the Mahometans, eſpecially in Egypt, and in ſome meaſure dedicated to the offices of religion; for whoever returns from a pilgrimage to Mecca, hangs it over his ſtreet-door, as a token of his having performed that holy journey. The ſuperſtitious Egyptians believe, that this plant hinders evil ſpirits and apparitions from entering the houſe; and on this account, whoever walks the ſtreets in Cairo, will find it over the doors both of Chriſtians and Jews. From the ſame plant, the Egyptians diſtil a water, which is ſold in the apothecaries ſhops at Cairo, and recommended in coughs, hyſterics, and aſthmas. An unexperienced French ſurgeon, ſays Haſſelquiſt, gave a Coptite, forty years old, afflicted with the jaundice, four tea-cups full of the diſtilled water of this ſpecies of aloe, and cured him in four days. This remedy, unknown to our apothecaries, is not difficult to be obtained, as the plant might eaſily be raiſed in the warm ſouthern parts of Europe. The Arabians call it *Sabbara*.

The under leaves of a ſpecies of aloe, termed by Linnæus, *aloe diſticha*, are of a dark green colour ſpotted with white,

 ſomewhat

ſomewhat reſembling the colour of ſoft ſoap, whence it is ſometimes diſtinguiſhed by the name of ſoap-aloe.

The name of pearl-aloe is given to a certain ſpecies, the leaves of which are cloſely ſtudded with white beautiful protuberances.

Of the leaves of the Guinea aloe, mentioned by Mr. Adanſon, in his Voyage to Senegal, the Negroes make very good ropes, not apt to rot in the water.

Dr. Sloane mentions two ſorts of aloe; one of which is uſed for fiſhing-lines, bow-ſtrings, ſtockings, and hammocks; the other has leaves which, like thoſe of the wild pine, and banana, hold rain-water, and thereby afford a very neceſſary refreſhment to travellers in hot countries, where there is generally a ſcarcity of wells and water.

The ſubſtance, known among druggiſts and apothecaries, by the name of aloes, is a thick, or inſpiſſated juice, drawn from the plants by expreſſion, or inciſion. Of this ſubſtance, there are three ſorts, which differ in purity, and were eſteemed by the generality of former botaniſts to be the produce of the ſame plant.

The manner of collecting and preparing the juice, is thus explained by J. Bauhin; having cut the herb in pieces, they bruiſe it, and ſqueeze out the juice, which they put up into a veſſel of a long and round ſhape, ſuffering it to ſtand for the ſpace of twenty-five days: in the mean while, they take care to clear off the uſeleſs ſcum, and throw it away; as alſo the upper part of the juice, until ſuch time as ſome difference appears in its colour and conſiſtence. The purer part of this juice, being concreted, is called ſuccotrine-aloes; the remaining part, being of a dark liver-colour, is called hepatick-aloes; and from the dregs, or ſettlings, is made that ſort called caballine, or horſe-aloes.

Notwithſtanding the contrary opinion of Columna, Bauhin, Ray, and other naturaliſts, we are now ſufficiently certain, that the three kinds of aloes juſt mentioned, are the juices of three different plants: the ſuccotrine, of the *aloe vera*, of Miller; the hepatic, of the *aloe vulgaris*, of Bauhin, *aloe Dioſcoridis et aliorum*, of Sloane, and *aloe barbadenſis*,

badenſis, of Miller; the caballine, of the *aloe Guineenſis caballina, vulgari ſimilis, ſed tota maculata*, of Commelin.

The fineſt, or pureſt, is the ſuccotrine aloes; ſo called, ſays Pomet, either becauſe the ſubſtance itſelf is a concreted juice, or, which is moſt probable, becauſe the beſt comes from Socotora, or Zocotra, an iſland in the ſtreights of Babelmandel. Succotrine aloes, when broken, is tranſparent; and when powdered, of a fine yellow golden colour, with a bitter taſte, and a ſmell like that of myrrh.

From the root, and leaves of the Weſt-India, or Barbadoes aloe, is prepared the ſecond ſort, called, from its colour, which is a dark red like that of a liver, hepatic aloes. This ſort, which is coarſer than the former, and ſeldom uſed in medicine except for horſes, is brought us in gourds or calabaſhes of different ſizes, and weight. It is clear, and not very fœtid in ſmell.

The third ſort, by much the coarſeſt, black, hard to break, and frequently adulterated, is called caballine aloes, becauſe, like the ſecond ſort, it is ſolely appropriated to the uſe of horſes. This ſort is generally ſold in the ſhops for the true hepatick aloes.

The month of March, ſays Mr. Hughes, in his Natural Hiſtory of Barbadoes, is the propereſt ſeaſon to make the aloes, which is done in the following manner: each Negro has by him, three or four portable tubs, into which the leaves are thrown, with their broken ends downwards. Theſe being full of large longitudinal veins, or veſſels, yield an eaſy paſſage to the juice, which is of a greeniſh yellow colour, to drip out. The juice being boiled for about five hours in a copper, or kettle, the watery particles evaporate; and the remainder comes to a conſiſtency, and thickens, as ſugar doth when ſufficiently boiled. The way to know when it is enough boiled, is to dip a ſtick in the liquor, and obſerve, whether the aloes ſticking to it, when cold breaks ſhort; if it does, then it is boiled to perfection, and fit to be poured into gourds, calabaſhes, or other veſſels for uſe.

Succotrine aloes, which is the only ſort now preſcribed in medicine, is ſeldom, or never adminiſtered in potion, by

reaſon

reaſon of its extreme bitterneſs; but is often given in pills, being, in fact, the baſis of the greateſt part of the purgative pills now in uſe. The Francfort, or angelic pill, is entirely compoſed of it.

In the city of Goa, as Garcias relates, aloes well bruiſed, and mixed with milk, are preſcribed with ſucceſs to ſuch as are afflicted with ulcers in the kidneys or bladder, and void purulent urine.

The herbs which produce the three medicines juſt mentioned, are by no means to be confounded with the tree, from which is procured the precious and rare wood called wood of aloes.

The flowers of fragrant *aletris* open only in the evening, when they emit a moſt agreeable odour, and cloſe again in the morning.

In aſphodel-lily with a reddiſh flower, *hemerocallis fulva*, the ſummits, or tops of the ſtamina, are filled with a copper coloured duſt, which ſheds on being touched; or if a perſon ſmells to the flowers, it will fly off, and ſpread over the face, which it dyes of a purple colour. This is a trick frequently practiſed by unlucky, and roguiſh people, upon the ignorant, and unwary.

The Egyptians put the flowers of tuberoſe in ſweet oil, and by this means give it a moſt excellent ſmell, ſcarce inferior to oil of jeſſamine.

The roots, leaves, and flowers of the white lily, which is a native of Paleſtine and Syria, are uſed in medicine. The root, or bulb, is unctuous, and frequently employed to ripen and digeſt tumours, and hard ſwellings. Of the flowers, and ſometimes of the root, are prepared an oil, and a diſtilled water, the former of which is ſucceſsfully applied in diſorders of the ſkin; the latter in the ſtone, colic, and pains of child-birth. The diſtilled water of the leaves is alſo of great uſe in diſtempers of the lungs.

Martagon lily differs from the other ſpecies, in having its petals rolled, or turned backwards, in form of a Turkiſh turbant; from which fancied reſemblance, the flower is generally known by the name of Turk's-cap. The root, either

either boiled, or baked in the ashes, furnishes a principal food to the natives of Siberia, who use, in like manner, instead of bread, the roots of other species of lily, particularly the *Lilium bulbiferum* of Linnæus. The taste, says Gmelin, is somewhat farinaceous, or rather insipid.

The root of white hellebore, *veratrum album*, promotes violent sneezing, and is mixed in ointments, to cure the itch. It is never now given inwardly. Boerhaave very justly observes, that it is a medicine much fitter for horses than men. It is administered as a sternutatory with great success, in apoplexies and lethargic complaints.

The plant is of a poisonous quality, and never fails to prove fatal to such cattle, or other animals, as inadvertently feed on it. In North America, where it is produced in great abundance, the maize, or Indian wheat, is preserved from voracious birds, by means of hellebore, in the following manner:—The roots being boiled, the maize is put into the water, as soon as cool, and having remained in it for a night, is then planted as usual. The grains, thus prepared, are quickly picked up, or plucked out by the crows, and other birds that infest the maize fields, some of which, in consequence of the insidious meal growing delirious and falling, strike such a terror into the rest, that they leave the field, and are not tempted to renew the visit. Care must be taken, however, that no other creatures touch the grains of maize thus steeped, as even a taste produces violent sickness, and, if swallowed in considerable quantity, the consequence is instant death. Scorbutic patients, it is said, have sometimes found great relief by washing the parts affected in a decoction of the roots of white hellebore. The application causes considerable pain, and a plentiful discharge of urine. A comb dipped in the same decoction, and passed through the hair, effectually destroys vermin in the head.

The squills, generally used in medicine, are red, and are the roots of the *scilla maritima*, or sea-onion, of Linnæus. The white sort, which is less common, and known by the name of male squill, is reckoned a variety of the same species. Squills, when found, are heavy, and full of juice. They

They are uſed in the ſhops for making vinegar, and oxymel of ſquills, and troches for treacle. The heart is reckoned poiſonous; for which reaſon, the druggiſts ſplit them in two, and throwing away the dry leaves and the heart, expoſe the remaining part, before it is proper to be uſed, to the air. A few grains of cinnamon, in powder, ſay writers on the Materia Medica, take off the emetic quality of this root, and render it a powerful diuretic, and an excellent medicine in dropſies.

If the judgment of the moſt numerous part of mankind who have taſted of the pine-apple, may be relied on, it certainly deſerves the appellation it has univerſally obtained, that of king of fruits; the agreeable variety, and delicate quick poignancy of its juice, being juſtly eſteemed to excel every other. The roots are many, and ſpread in a circular manner. From the centre riſes a ſtrong, hard ſtalk, ſurrounded near the earth, and for a conſiderable way up the ſtalk, with long green leaves, which are ſet on alternately, and finely ſawed on their edges. The top of the ſtalk ſuſtains the fruit, which is called the pine, from ſome reſemblance which it has on the outſide to the cone of the pine-tree. The fruit is beautifully decorated at top, with a crown of fine green ſharp-pointed leaves, which are likewiſe ſawed on their edges. The flowers are funnel-ſhaped, placed above the fruit, of a blue colour, and conſiſt of three petals. When the flowers are gone, the fruit enlarges and becomes a fleſhy, knobby ſeed-veſſel, of the berry kind, full of juice. The ſeeds, which are lodged in the knobs, or tubercles of the fruit, are very ſmall, and almoſt kidney-ſhaped. Some time before the fruit is ripe, two, three, or four ſuckers grow from the ſtalk below, yet cloſe to the fruit: theſe ſhoots are taken off, and planted; and will in about fourteen months time produce a ripe pine. Thoſe who cannot procure theſe ſuckers, ſometimes plant the top, or crown. This, though intended by Nature chiefly as an ornament to the fruit, will grow, and in time bear a fruit; not ſo ſoon, however, nor ſo good as that produced by thoſe ſuckers, which Nature intended to be the means of propagating this fruit. The

three

three beſt ſorts of pines are the Surinam, the ſugar-loaf, and queen-pine. The fruit ought to be eaten ſoon after it is cut, and ſhould not be kept on the ſtalk in the garden till it be very ſoft on the outſide, as the cuſtom too frequently is.

As pine apple has naturally a certain degree of acrimony, the Europeans at the Cape of Good Hope remove it, as Kolben informs us, by laying the fruit in ſlices, in ſpring-water. It is afterwards put in Rheniſh wine, and has ſugar ſcattered upon it, when it taſtes deliciouſly, having thus acquired much of the flavour of ſtrawberries. Of the expreſſed juice of the Ananas, is prepared an excellent wine, which, ſays Dr. Fermin, in his Natural Hiſtory of Surinam, is eſteemed almoſt equal to Malmſey, and intoxicates. Kolben, whom I juſt mentioned, aſſerts, that pine-apple, not fully ripe, if eaten by a woman with child, will certainly occaſion abortion.

To the ſame genus with the pine-apple, belongs the Karatas, or penguin, a fruit very common in the Weſt Indies, ſo named from its outward covering, which is a ſmooth whitiſh-yellow huſk. The outſide of the plant is compoſed of ſome ſcores of hard ſtiff green leaves, two inches broad, with ſharp-hooked prickly edges. Theſe leaves, which grow to about nine feet high, turn ſcoopingly inward on the upper ſide, by which means they ſave and convey the dew and the rain that fall upon them, to the roots. They grow, likewiſe, almoſt impenetrably thick near the earth, ſurrounding and guarding a circular crown, of about a foot diameter. From this grows a cluſter of fruits, each four inches long, and one broad, pointed at both ends, and quadrangular in the middle; by which means they are ſo cloſely joined, that they cannot eaſily, until very ripe, be taken aſunder. The white outward cover being peeled off, diſplays a white pulpy ſubſtance, containing a great number of very ſmall flattiſh coal-black ſeeds. This ſubſtance, which is the eatable part, has ſome ſmall reſemblance, in its flavour, of the pine-apple, and is eſteemed cooling and wholeſome. This fruit, when nearly ripe, being gnawed by rats, or other vermin, emits, from the wounded part, drops of the moſt tranſparent gum; which

which manifeftly fhews, that its juices are much impregnated with volatile oil. A moderate ufe of this fruit has been very ftrongly recommended in fevers, and with juftice; for by its penetrating, grateful, and active fharpnefs, it is capable of laying open the orifices of the falival ducts, and thereby enabling the glands of the mouth and throat to difcharge the contents, which could not be done before the impediment was removed.

Befides this fort, there is a large and round penguin, of the fize of an apple, which is much more palatable than the other, and tafting not unlike a ftrawberry, is frequently called by that name.

Tillandfia, the caraguata of Father Plumier, the large wild barren pine of the Weft Indians, is a parafitic plant, and ought, perhaps, in ftrict propriety, to be denominated an aquatic: for although it is fufpended in the air among the branches of lofty trees, to whofe boughs it is faftened by its numerous roots; yet it is not indebted to thofe boughs, like the miffletoe, and other parafitic plants, for nourifhment, but merely for fupport: provident Nature having, in a very extraordinary manner, fupplied this with other means to preferve its exiftence: for the leaves, which much refemble thofe of the pine-apple, but are larger, furround this plant in a circular manner: each leaf being terminated near the ftalk, with a hollow bucket, which contains about half a pint of water. It is by thefe numerous fmall refervoirs of water, that the roots, as well as every other part of this plant, are fupplied with nourifhment, without the help of any earth. The flourifhing condition of this plant, as well as the great growth of fig-trees upon barren rocks, fhews that water is of greater ufe to vegetation, than even earth itfelf.

One contrivance of Nature in this vegetable, fays Dr. Sloane, is truly admirable. The feed is crowned with many long, downy threads, not only that it may be carried every where by the wind; but that, by thofe threads, when driven through the boughs, it may be held faft, and ftick to the arms, and prominent parts of the barks of trees. So foon

as it ſprouts, or germinates, although it be on the under part of a bough, its leaves and ſtalk riſe perpendicular, or erect; if they aſſumed any other direction, the ciſtern or reſervoir juſt mentioned, made of the hollow leaves, could not hold water, which is neceſſary to the life and nouriſhment of the plant. In ſcarcity of water, this reſervoir is uſeful, not to the plant only, but to men, and even to birds, and all ſorts of inſects, which come thither in troops, and ſeldom go away without refreſhment.

To the ſame purpoſe, Dampier, in his Voyage to Campeachy, relates, that the wild pine has leaves that will hold a pint and a half, or quart of rain-water, which refreſhes the leaves, and nouriſhes the roots. When we find theſe pines, he continues, we ſtick our knives into the leaves, juſt above the root; and the water guſhing out, we catch it in our hats, as I myſelf have frequently done, to my great relief.

CORONATRICES, and CORONATI, from *corona*, a crown. The name of the eighth claſs, in Linnæus's Method founded upon the preſence, different ſpecies, figure, ſituation, duration, regularity, and number of diviſions of the calyx or flower-cup, conſiſting of plants, which, like French willow, and tree-primroſe, have the ſeed-bud placed under the flower-cup, which ſerves it for a crown. This is the *Germen inferum*, and *Calyx ſuperus* of Linnæus.

CORONULA, (diminutive from *corona*); a little crown; a hem, or border, which ſurrounds the ſeeds of ſome flowers in form of a crown. Linnæus defines it to be a ſort of little calyx, or flower-cup, *calyculus*, which adhering to the naked ſeeds of ſome plants, ſerves to diſperſe them. The principal crown of the ſeed is that fine downy appearance termed by Linnæus, PAPPUS, which ſee.

In ſcabious, *knautia*, and ſome others, the flower-cup becomes the crown of the ſeed.

CORTEX, (from *corium*, leather, a hide, and *tego*, to cover, *quod quaſi corium*, ſays Iſidorus, *lignum tegat*); the rind, or coarſe outer bark of plants. The organiſation of the outer and inner barks, which differ principally in the fineneſs

fineneſs of their texture, is particularly explained under the article STRUCTURA *Vegetabilis*,

CORYDALES, (from κορυς, *galea*, an helmet, quod à Καρα, caput, the head). The name of the twenty-fourth order in Linnæus's Fragments of a Natural Method, conſiſting of plants which have irregular flowers, ſomewhat reſembling a helmet, or hood.

The title of this order ſeems to have been ſuggeſted by a genus in Dillenius of the ſame name, which Linnæus has joined to his genus *Fumaria*.

Liſt of the Genera *contained in this Natural Order.*

SECTION I.

Plants with helmet-ſhaped Flowers, having their Stamina diſtinct.

Linnæan Genera.	*Engliſh Names.*
Epimedium, —	— Barren-wort.
Hypecoum.	
Leontice, —	— Lion's-leaf.
Melianthus, —	— Honey-flower.
Pinguicula, —	— Butter-wort, or Yorkſhire ſanicle.
Utricularia, —	— Water-milfoil.

SECTION II.

Plants with Helmet-ſhaped Flowers, having their Stamina united either by the Filaments, or Tops.

Fumaria, —	— Fumatory.
Impatiens, —	— Balſam, or Female Balſamine.
Monnieria.	

Habit and Structure of the Plants of this Order.

Theſe plants are moſtly herbaceous and perennial.

The ROOTS are tuberous, or knobby.

The STEMS are generally branched.

The LEAVES are alternate, ſometimes ſimple, but moſt commonly winged; that is, conſiſt of two or three pair of lobes, or leſſer leaves, which are attached to the middle rib. In monnieria, and ſome ſpecies of balſam, the leaves are oppoſite.

The foot-ſtalk of the leaves is narrow, except in barren-wort, where it is large, and has a membranaceous border.

In a ſpecies of African honey-flower, STIPULÆ, or ſcales, are firmly attached to the foot-ſtalk of the leaves, under which they are placed, ſo as to make part of its ſubſtance; the ſame ſubſidiary leaves are likewiſe united from oppoſite ſides of the ſtalk; whence they form the appearance of a ſingle ſcale, and are ſo denominated by Linnæus.

The middle rib of the leaves, in ſome ſpecies of fumatory, particularly that termed by Linnæus *fumaria claviculata*, is terminated with one branching tendril, which appears to be a fine cylindrical prolongation of the wings, or diviſions of the leaves.

In balſam, ſmall glands, or veſſels of ſecretion, are produced from the baſe of the leaves; roundiſh veſſels of the ſame kind, diſtended with air, are placed at the root of water-milfoil; and in butter-wort, the glands are placed upon the ſurface of the leaves.

The FLOWERS are univerſally hermaphrodite; that is, contain both male and female organs within the ſame covers.

They proceed either ſingly from the wings or angles of the leaves, as in butter-wort, and *monnieria*; or are collected in cluſters, at the end of the branches, as in fumatory, lion's-leaf, and *hypecoum*.

The CALYX, or flower-cup, conſiſts of two, four, five, or ſix leaves, which are frequently coloured, and commonly fall off immediately before, or very ſoon after, the expanſion of the petals.

In *monnieria*, and butter-wort, the calyx is permanent; that is, accompanies the ſeed-bud to its maturity.

The COROLLA, or coloured inner cover of the flower, is generally irregular, of one, or many pieces, gaping, and furniſhed

furniſhed with a *nectarium*, or ſtriking appendage, which is very different, in the different genera. In butter-wort, water-milfoil, and balſam, it is ſhaped like a horn, and produced from the baſe of the petal. In barren-wort, four cup-ſhaped *nectaria*, of the length of the petals, are inſerted into the common receptacle. In lion's leaf, ſix equal ſpreading ſcales, furniſhed with foot-ſtalks, are attached to the baſe of the petals. In fumatory, each lip of the irregular petal terminates behind in a ſpur, which, in the lower lip, is generally leſs prominent. In *monnieria*, a ſmall egg-ſhaped nectariferous ſcale, is ſeated at the baſe of the ſeed-bud; and in honey-flower, a very ſhort ſcale of the ſame kind is placed within the lower diviſion of the calyx.

In ſome ſpecies of balſam, the horn of the nectarium; in others, two of the five irregular petals, are wanting.

The STAMINA are in number from two to ſix, and of a proportionate length, except in honey-flower, which has two ſhorter than the reſt.

The FILAMENTS are diſtinct, except in two genera, fumatory and *monnieria*, which have two ſets or ſtrings of filaments united in a cylinder. The former has three *anthers*, or tops, on each ſet of united filaments; the latter two *anthers* on the upper ſet, and three on the lower; from whence we may conclude, that the number of ſtamina in fumatory, is ſix, of *monnieria*, five; yet Linnæus has placed this laſt, along with fumatory, in an order, whoſe characteriſtic it is to have ſix ſtamina.

The genus *monnieria*, which, in America, has conſtantly five diviſions in the corolla, and five ſtamina, frequently bears flowers in Europe, which have only four diviſions in its irregular gaping petal, and four ſtamina.

The ANTHERS, or tops, in this order, are univerſally diſtinct, except in one genus, balſam, where they are formed into a cylinder that is divided at the baſe.

In barren-wort, and lion's-leaf, the anthers burſt, when ripe, from the baſe to the top, through the whole length.

The SEED-BUD is generally roundiſh; ſometimes, however, angular, as in *monnieria*, and honey-flower.

The

The STYLE is commonly fingle, extremely fhort, flender, or thread-fhaped, and crowned with a fimple *ftigma*.

Hypecoum has two ftyles: balfam, none.

The SEED-VESSEL is either a hollow, blown up berry, as in lion's-leaf; a capfule of one cell, as in butter-wort, and water milfoil; a longifh pod, *filiqua*, as in barren-wort and hypecoum; or a roundifh pod, *filicula*, as in fumatory.

In balfam, the capfule, which in fome fpecies is long, in others round, or egg-fhaped, burfts open with an elaftic fpring, at five feveral valves, which are twifted fpirally.

Monnieria has five capfules.

In *Hypecoum*, the pod is jointed, and contains as many cells as there are joints. This ftriking mark, however, is not conftant: the *nectarium* is invariable.

The SEEDS are generally numerous, and round.

In *monnieria*, each feed is inclofed in a dry covering with two valves, called by Linnæus *arillus*, which falls off fpontaneoufly.

Hypecoum has a fingle feed lodged in each cell or joint of the feed-veffel.

In balfam, the feeds, which are numerous, are affixed to a pillar in the centre of the capfule.

The feeds of *hypecoum* remain a year in the ground without rifing.

The juice of thefe plants, which is generally of a yellow colour, is narcotic and anodyne. The roots are opening. Officinal fumatory, which is efteemed refrefhing, is bitter, and foapy; its juice depofits a number of nitrous chryftals, of eight fides, which fparkle in the fire. The root of bulbous fumatory is an emmenagogue; applied externally, it cleanfes ulcers, and proud flefh.

The juice of common fumatory is greatly commended for bilious colics; it deftroys warts, and other prominences in the fkin; and mixed with a great quantity of water, is an efficacious lotion in diforders of the eyes.

A fpecies of fumatory is termed *fumaria cava*, from its having a pretty large tuberous root, hollowed in the middle.

The juice of all the fpecies of *hypecoum* is of a yellow colour,

colour, refembling that of celandine, and is affirmed by fome eminent phyficians, to be as narcotic as opium. From the nectarium of the bloffom, the bees collect great quantities of honey.

The pods of yellow balfamine, or touch-me-not, are taper, twifted fpirally like a fcrew, and upon being lightly touched, or fhaken with the wind when ripe, burft open, and eject the feeds with confiderable elafticity.

Barren-wort, fays an author, whofe name I have forgot, is fo termed, from the flowers being totally eclipfed, or covered by the leaves; fo that, without proper infpection, they appear to be wanting.

From the calyx of the honey-flower, oozes a fweet liquor, which is fometimes ufed in medicine, and efteemed ftomachic, and nourifhing. Kolben fays, that the Hottentots, and moft of the Europeans of the Cape of Good Hope, are exceedingly fond of the fweet juice of the two fpecies of *Melianthus*, which grow naturally there, and never fail of a treat whenever they can find it. *Vide* Kolben, vol. ii. p. 243.

Both honey-flower, however, and barren-wort, are by moft authors deemed poifonous. *Vide Phil. Bot.* p. 282, fect. 355.

CORYMBIFERÆ, from *corymbus*, a mode of flowering, and *fero*, to bear. The name of a clafs in Morifon and Ray's Methods, and of Vaillant's Arrangement of the Compound Flowers; confifting of plants, whofe flowers are produced in clufters or bunches like thofe of ivy-berries, and form that particular fort of head, termed by botanifts, *corymbus*. *Vide Infra.*

Tanfy, feverfew, elecampane, colt's-foot, groundfel, and marigold, furnifh examples.

CORYMBIFERÆ is likewife the name of an order or divifion of the compound flowers, adopted by Linnæus, after Ray and Vaillant, in the former editions of his Fragments of a Natural Method. This title is in the later editions changed for *Difcoideæ*, another name borrowed from Ray's Method, but ufed in a fomewhat different fenfe.

CORYMBUS, (a Κορυς, *galea*, an helmet, quod a

P Κορα,

Καρα, *caput*, the head,) properly ſignifies a cluſter of ivy-berries. This is Pliny's definition in the 34th Chapter of the 16th Book of his Natural Hiſtory. *Corymbus, inquit, eſt hederæ racemus in orbem circumactus*. By Columella it is uſed to expreſs all ſuch fructifications as grow in a head, or, as Scaliger writes, *quicquid in panicam aut ſtrobilum aſſurgit*, as artichoke, thiſtle, &c.—In modern Botany, Corymbus is a mode of flowering, in which the leſſer or partial flower-ſtalks are produced along the common ſtalk, on both ſides; and, although of unequal lengths, riſe to the ſame height, ſo as to form a flat and even ſurface at top.

The term is exemplified in *ſpiræa opulifolia*, ſcurvy-graſs, gold of pleaſure, ſtock, and the other croſs-ſhaped flowers, the *Tetradynamia* of Linnæus.

A corymbus differs from an umbel, another manner of flowering, in that the numerous partial foot-ſtalks ariſe from different parts of the common ſtalk; whereas in the umbelliferous flowers, they all proceed from a common centre. *Vide* UMBELLA.

A corymbus may be ſuppoſed to be formed from a ſpike, a third mode of infloreſcence, as Linnæus terms it, by raiſing the flowers on partial foot-ſtalks, which riſe to a proportionable height. The flowers in a ſpike are ſeated on the common ſtalk, without any proper or partial foot-ſtalk. *Vide* SPICA.

This manner of flowering as well as the others, frequently affords certain marks in diſtinguiſhing the ſpecies. Thus in *ſpiræa*, the ſpecies are ſcarce to be diſtinguiſhed, but by the mode of flowering, which in ſome, is a corymbus; in others, an umbel; and in others, a *racemus*, or cluſter like that of grapes. *Vide* RACEMUS.

The partial foot-ſtalks in a corymbus, are ſometimes ſimple, that is, have no branches, as in ſome ſpecies of ſtar of Bethlehem; ſometimes branch out into ſeveral irregular ramifications, yet ſo as to form an even ſurface at top. In the former caſe, the corymbus is ſaid to be ſimple; in the latter, compound.

The corymbus is a mean betwixt the cluſter, *racemus*, and

and the umbel; like them, its flowers are furniſhed with proper foot-ſtalks, which riſe gradually from bottom to top, as thoſe of the *racemus*, and are produced to the ſame height, as thoſe of the umbel.

COTYLEDONES, (from Κοτολη, cavitas, a hollow); a term of placentation transferred from the animal to the vegetable kingdom. The periſhable, porous ſide-lobes of the ſeed, which involve, and, for ſome time, furniſh nouriſhment to the embryo-plant.

The lobes in queſtion, generally two in number, are very conſpicuous in the bean, and moſt of the leguminous tribe, upon ſtripping off the huſk, or outer cover of the ſeed; particularly if they have previouſly been laid in earth or water. Their ſubſtance is meally, mucilaginous, and eaſily ferments. They reſult from the expanſion of an infinite number of branching veſſels.

The lobes are externally convex, internally flat, unleſs where they are united, and infold the principle of life, *corculum*, which communicates with them by means of two large trunks of veſſels, that ſupply it with nouriſhment, and correſpond to the navel-ſtring in animals; as the lobes themſelves ſeem to anſwer the purpoſe of the placenta in women, and cotyledones in brutes.

We ſaid, in the definition, that the lobes are the periſhable part of the ſeed. To explain this, we muſt previouſly obſerve the changes which are effected upon the embryo-plant, in the firſt ſtages of vegetation.

After lying ſome time in water, or earth, the lobes of the ſeed, penetrated by the watery particles, which are charged with nutritive juices, put in motion by heat, ſwell and thicken; the air contained within their ſubſtance, dilating, burſts open the outer cover, or huſk, which unites them, and diſcovers the radicle, and embryo-plant. In this firſt ſtage, the ſeed is properly ſaid to ſprout, or germinate. Soon after, the lobes expanding, riſe out of the earth, in the form of leaves; very different, however, from thoſe which the plant is afterwards to produce. In this ſtage, the ſeed is properly ſaid to riſe.

These

These leaves, called, for diſtinction, ſeminal, or ſeed-leaves; (that is, the firſt leaves produced by the ſeeds) are commonly two in number: ſome ſeeds, however, have only one ſeminal leaf; in which caſe, the plants by botaniſts are termed Monocotyledonous, a term of the ſame import; as thoſe which riſe with two ſeminal leaves, are ſtiled Dicotyledonous. Cæſalpinus, and Jungius, termed both theſe kinds of ſeeds, univalvular, and bivalvular; that is, having one, or two ſeed-covers. The former was the firſt who diſcovered the number of lobes in the embryo of ſeeds.

To proceed with our infant-plant. Under this new form of leaves, the lobes elaborate, and rectify the ſap, which is deſtined to nouriſh the tender vegetable. The young root too, which naturally tends downwards, has by this time made ſome efforts to penetrate into the boſom of the earth, where meeting with ſtrong exhilarating juices, it tranſmits them to the lobes, through which they paſs highly refined, to the future plant. The ſtem begins to appear; but although enlarged in volume, its parts are not developed, but continue as they were in the ſeed. The lobes, ſtill united to the plant by the two trunks of veſſels, accompany it for ſome time after its eruption from the earth, till, having acquired ſufficient ſtrength and growth, the ſeminal leaves become uſeleſs, wrinkle, wither, and die away. *Vide* GERMINATIO.

Of plants which have only one ſeminal leaf, we muſt carefully diſtinguiſh thoſe in which the lobe forms a ſort of ſheath ſurrounding the whole body of the plant, as in the palms, graſſes, and liliaceous vegetables, from thoſe in which the lobe is only extended in length, as in dodder.

Pine and fir trees, ſays Linnæus, have ten; cypreſs, five; flax, four lobes; in fact, however, theſe plants have only two lobes, each of which is differently divided almoſt to the baſe: the lobes only being perfectly diſtinct.

The preſence of the lobes, or ſeminal leaves, ſufficiently evinces the previous exiſtence of the ſeed; and confutes the ridiculous opinion of equivocal generation, long ſince exploded.

The

The lobes being in the vegetable œconomy, what the placenta is in the animal, their difpofition at the time when the feed begins to grow, is termed very properly by Linnæus, placentation.

In the mufhrooms, ferns, and other imperfect plants, the feminal leaves are not fufficiently afcertained. The feeds of the moffes want only the proper covering and lobes. *Vide* ACOTYLEDONES.

The number of lobes, or feed-leaves, furnifhes a primary diftinction in Ray's Method.

CRETA, chalk; a fpecies of earth.

CRUCIFORMIS *Flos*, (from *crux*, a crofs, and *forma*, a fhape or figure); a crofs-fhaped flower; a flower confifting of four equal petals, which fpread at the top, in form of a crofs. Stock gilly-flower, honefty, and candy-tuft, furnifh examples.

CRUCIFORMES. The name of the fifth clafs in Tournefort, and feventeenth in Pontedera's Method, confifting of plants with crofs-fhaped flowers. Thefe are the *Siliquofæ* of Morifon, Hermannus, Royen, Boerhaave, and Ray; the *Tetrapetali regulares* of Rivinus, and Chriftopher Knaut; the *Tetrapetali uniformes* of Chriftian Knaut; and the *Tetradynamia* of the Sexual Method. *Vide* SILIQUOSÆ, &c.

CRYPTOGAMIA, from κρυπτω, to hide, and γαμος, a marriage; a clandeftine marriage. The name of the twenty-fourth clafs in Linnæus's Sexual Method, confifting of plants, in which the parts of fructification, the criterion of the fexes, are, either from their minutenefs, or their particular fituation, entirely concealed, or imperfectly vifible.

The great obfcurity that ftill prevails in this very confiderable part of the vegetable kingdom, notwithftanding the ingenious refearches of Ray, Micheli, Dillenius, Gmelin, Haller, Battarra, Schæffer, Stackhoufe, and other eminent names in Botany, the Sexual Method of Arrangement is little qualified to difpel. Indeed it would be difficult to conceive a fyftematic method, in which the numerous plants of the clafs *Cryptogamia*, could be arranged with facility; but in Linnæus's Syftem, the difficulty muft be tenfold, as, from

from the abſence, or unaſcertained preſence of the very organs which lay the foundation of the primary diviſions, the character of the claſs and order is neceſſarily, in many inſtances, merely negative; and the ſubordinate diviſions, of courſe, are ſtrangely huddled together, without eſſential and certain marks of diſtinction.

The claſs Cryptogamia, which correſponds to the Imperfect Plants of Ray, and to the 16th and 17th claſſes of Tournefort's Method, containing herbs not bearing flowers, with and without ſeeds, is divided into four orders. Theſe are, *Filices*, Ferns; *Muſci*, Moſſes; *Algæ*, Sea-weed, or Wrack; and *Fungi*, Muſhrooms. *Vide* FILICES, ALGÆ, *&c.*

For a more particular account of the progreſſive diſcoveries of Naturaliſts in this extenſive department of Botanical knowledge, the reader is referred to the author's INSTITUTES OF BOTANY, Part I. p. 67, and ſeq.

Conſidered as a natural claſs, or rather as an aſſemblage of natural orders, the plants in queſtion are generally of a ſuſpicious nature.

CUBITUS, a term of meaſure. *Vide* MENSURA.

CUCURBITACEÆ, from *cucurbita*, a gourd; the name of the thirty-fourth order in Linnæus's Fragments of a Natural Method, conſiſting of plants which reſemble the gourd in external figure, habit, virtues, and ſenſible qualities.

Liſt of the Genera *contained in this Natural Order.*

SECTION I.

Cucurbitaceous Plants with Hermaphrodite Flowers.

Linnæan Genera.			*Engliſh Names.*
Cronovia.			
Melothria,	—	—	Small creeping Cucumber.
Paſſiflora,	—	—	Paſſion-Flower.

SECTION

SECTION II.

Cucurbitaceous Plants with male and female Flowers produced either on the ſame or diſtinct Roots.

Linnæan Genera.		English Names.
Anguria Jacquin.		
Bryonia,	— —	Bryony.
Cucumis,	— —	Cucumber, Melon.
Cucurbita,	— —	Gourd, Pumpion.
Elaterium Jacquin.		
Fevillea.		
Momordica,	— —	Male Balſam-apple.
Sicyos,	— —	Single ſeeded Cucumber.
Trichoſanthes,	— —	Serpent-Cucumber.

Habit and Structure of the Plants of this Order

The plants of this order, which generally climb, and have long diffuſed branches, are moſtly herbaceous and perennial. Wild cucumber, the *Elaterium* of Boerhaave, a ſpecies of *Momordica* of Linnæus, is the only plant in this order, which riſes erect, without climbing, or ſupporting itſelf on the plants in its neighbourhood. Some ſpecies of paſſion-flower are of the ſhrub and tree kind, and retain their leaves during the winter.

The ROOTS, in the perennial plants of this order, are ſhaped like thoſe of turnip; in the annuals, they are branched and fibrous.

The STEMS are cylindric and ſucculent. The young branches have generally five angles. In ſome ſpecies of paſſion-flower, they are ſquare.

The LEAVES are alternate, angular, and ſometimes hand-ſhaped. They are attached to the branches by a foot-ſtalk, which is pretty long, and cylindrical, without any furrow. In a ſpecies of paſſion-flower, hence denominated *paſſiflora veſpertilio*, the leaves are ſhaped like the wings of a bat, and ſupported on a foot-ſtalk half an inch long.

From

From the wing or angle of each of the upper leaves, proceeos a tendril, which is either ſimple or branched, and twiſts itſelf ſpirally round the different bodies in its neighbourhood, for the purpoſe of ſupporting and training the branches.

The lower leaves have no tendril. Wild-cucumber, in which the tendrils ſeem wanting, has a ſmall *ſtipula*, or ſcale, in the form of a triangular tongue, at the origin of each of the male flowers.

Beſides tendrils, water-melon, and ſome ſpecies of bryony, have a *ſtipula*, or ſcale, of an oval ſhape, which iſſues from the wing or angle of each leaf. In male-balſam apple, a ſcale of the ſame kind accompanies each flower. Paſſion-flower has two pretty large *ſtipulæ*, or ſcales, which are placed on both ſides of the foot-ſtalk of the leaf.

In the gourd, glands, or ſecretory veſſels, are placed on the baſe of the leaf: in the paſſion-flower, they are ſeated on the foot-ſtalks.

The FLOWERS, in plants of the firſt ſection, are hermaphrodite; male and female, in thoſe of the ſecond. In this laſt, the male flowers are generally ſeparated from the female upon the ſame root, and that either in the ſame wing, or angle of the leaves, as in *Sicyos* and ſerpent-cucumber; or in different angles, as in gourd, and ſome ſpecies of bryony.

In *fevillea*, and ſome ſpecies of bryony, the male flowers are produced on diſtinct roots from the female.

Small creeping cucumber, *melothria*, has hermaphrodite flowers; in every other reſpect it reſembles the cucumber, to which moſt botaniſts have joined it.

The flowers proceed from the wings of the leaves, either ſingly, as in pumpion, water-melon, male balſam-apple, and paſſion-flower; two and two, as in ſome cucumbers; in a *ſpike*, as in *fevillea*, and ſerpent-cucumber; or in a *corymbus*, as in bryony, and the male flowers of gourd. In ſingle-ſeeded cucumber, the male flowers form a ſpike, the female a corymbus.

The FLOWER-CUP, in the female flowers, is placed upon

upon the feed-bud, and generally confifts of one bell-fhaped leaf, that is deeply divided into five equal fegments; and, unlike the other plants which have the calyx feated upon the fruit, falls off with the petals and the other parts of the flower. In the genus *gronovia*, the calyx is permanent; that is, accompanies the feed-bud to its maturity. In the paffion-flower, it is feated below the feed-bud. *Elaterium*, a genus of M. Jacquin, has no calyx.

The COROLLA confifts of one petal, with five equal divifions, which adhere to the tube of the calyx as if glued to it. *Anguria*, *Gronovia*, and paffion-flower, have five petals. Thefe, in the latter, are lancet-fhaped, flat, of the fize, figure, and colour of the calyx. A fpecies of paffion-flower, termed by Linnæus *paffiflora fuberofa*, wants the petals.

The NECTARIUM, in paffion-flower, is very fingular, confifting of a number of beautiful fibres, or rays, which are placed horizontally within the petals, in three feries or rows. Thefe Linnæus calls, very improperly, a triple crown: a triple helmet would have been equally expreffive of the appearance; but this is not the only impropriety in Linnæus's defcription of this beautiful flower.

The gourd has a hollow, triangular gland, or veffel of fecretion, feated in the middle of the flower.

In *fevillea*, the nectarium confifts of five crooked threads, or ftrings, which in the male-flowers are placed in the middle, alternate with the ftamina.

The STAMINA are, in number, from one to five, fhort, and generally inferted into the calyx.

In paffion-flower, they are attached to a pillar-fhaped receptacle, which ftands in the middle of the flower, and is crowned with the feed-bud. This receptacle, Linnæus, who was refolved, at all events, to obtrude this genus into his clafs *Gynandria*, has dignified with the name of a pillar-fhaped ftyle: by which means he has fallen into the abfurdity of afferting, that the ftyle in the paffion-flower elevates the feed-bud, contrary to what is obferved in every other flower yet known. The ufeleffnefs of this pillar-fhaped ftyle

ſtyle farther appears from this circumſtance, that three ſtyles properly ſo called, ariſe from the *germen*, as in other flowers.

The filaments, in this order, are diſtinct; the ANTHERS, or tops, in moſt plants of the ſecond ſection, are united in a cylinder. Bryony has five anthers to three filaments.

In the female-flowers are ſometimes obſerved three, or four filaments, which have the appearance of ſtamina without tops. Theſe, in bryony, and male balſam-apple, are attached to the top of the tube of the petal; in pumpion, gourd, and water melon, they proceed from its baſe.

The anthers in paſſion-flower, are ſlightly attached to the filaments, on which they turn like a vane, or the needle of a compaſs.

The SEED-BUD is ſingle, and placed below the receptacle of the flower. In paſſion-flower, it is ſeated upon a long pillar-ſhaped receptacle, in the middle of the flower. The ſeed-bud, in the genus *elaterium*, is covered with prickles.

The STYLE is generally ſingle, cylindrical, of the length of the calyx, and crowned with a triple *ſtigma*. Paſſion flower has three ſtyles; *fevillea*, five. The male-flowers of ſerpent-cucumber, have three very ſmall ſtyles, adhering to the tube of the calyx.

The SEED-VESSEL is generally pulpy, of the apple, or berry kind, and conſiſts of one, two, or three cells. In elaterium, and gronovia, it is a capſule, which in the former is prickly and ſucculent.

The fruit of ſingle-ſeeded cucumber, is at firſt a thorny berry, which dries, and hardens as it ripens, ſo as to become a very dry capſule, before the ſeeds have attained maturity. The partitions which ſeparate the cells are compoſed of fibres ſurrounded with a watery pulp, which, when dried, diſcovers the fibres, under the form of a thick-ſet web or net.

The SEEDS are numerous, generally flat, or compreſſed, and ſometimes, as in paſſion-flower and cucumber, covered with that kind of proper coat called by Linnæus, *arillus*. *Vide* ARILLUS.

In

In male balſam-apple, and wild cucumber, the ſeeds burſt, or are ſpirted from their cells with an elaſtic ſpring.

The fruit of theſe plants is generally purgative and refreſhing. That of ſome of them proves a very violent emetic, when uſed too freely.

Male balſam-apple, is famous in Syria for curing wounds. The natives cut open the unripe fruit, and infuſe it in ſweet oil, which they expoſe to the ſun for ſome days, until it is become red; and then preſent it for uſe. Dropped on cotton, and applied to a freſh wound, the Syrians reckon this oil the beſt vulnerary next to balſam of Mecca, having found by experience, that it often cures large wounds within three days. The leaves and ſtems of this plant are uſed for arbours, or bowers.

The Egyptian balſam-apple, called by the Arabians liff, or luff, is cultivated in gardens, in the eaſtern countries, and climbs upon palm trees; covering, and elegantly adorning their ſtems.

The elaterium of the ſhops, is the fruit, or rather the inſpiſſated fæcula of the juice of the fruit, of the wild, or aſs's cucumber, a ſpecies of balſam-apple. It is uſually ſent us from Spain, and the ſouthern parts of France, where the plant is common, in ſmall flat whitiſh lumps, or cakes, that are dry, and break eaſily between the fingers. It is of an acrid, nauſeous, bitter taſte, and ſtrong offenſive ſmell, when newly made: but theſe, as well as its other qualities, it loſes, after being kept for ſome time. Elaterium is a very violent purge and vomit, and is now very ſeldom uſed. The plant is commonly called ſpirting-cucumber, from its caſting out its ſeeds, together with the viſcid juice in which they are lodged, with a violent force, if touched, when ripe; from which circumſtance it has ſometimes obtained the appellation of *noli me tangere*, or, touch me not.

The root of white bryony is ſaid to be ſo violent in its effects, when taken freſh, that the peaſants call it the mad turnip; being dried, it enters as an ingredient into ſome medicinal compoſitions, particularly bryony-water, in which

it

it is reckoned to aſſiſt as a powerful uterine cleanſer. Some believe bryony to be an excellent remedy againſt the bites of ſerpents, and other venomous creatures. Its fæcula, when dried, is like ſtarch; but as this is found a medicine of little uſe, there is hardly any of it now made.

In the eaſtern countries, and both the Indies, bottle-gourd, the *cucurbita lagenaria*, of Linnæus, is very commonly cultivated, and ſold in the markets for the table, and is the principal part of the food of the common people in the warm months, particularly from June to October. The Arabians call this kind of gourd, charrah. They boil it, and ſeaſon it with vinegar; they likewiſe fill the ſhell with rice and meat, and thus make a kind of pudding, like what we ſometimes, in England, prepare of the ſhell of pumpion, or pumpkin.

The leaves of the bottle-gourd are large, almoſt circular, covered with fine ſoft hairy down, and ſmell ſtrongly of muſk. The flowers are ſo tender, that they cloſe as ſoon as the ſun ſhines upon them. The outſide tegument or rind of the fruit, as it ripens, grows hard; and when the ſeeds and pulp are taken out, will hold water, for which purpoſe it is ſometimes uſed. Some gourds are ſix feet long, and one and a half round, and when cleared of their pulp, will contain twenty-two gallons: ſuch, however, are very uncommon.

The different kinds of pumpkin, the *cucurbita pepo* of Linnæus, are generally diſtinguiſhed by the names of the white, the blue, the marbled, and the garden pumpkin. Theſe make a great part of the food of the poorer ſort in ſummer, as well in Aſia, and Africa, as in America. The ſtalks and leaves are hairy, the flowers yellow, the fruit is generally, when young, of a mixture between a deep blue and a pale white. It is boiled and eaten with butcher's meat; and by the poorer ſort is much uſed in ſoups.

Squaſh, *cucurbita melopepo*; and warted gourd, when boiled, are by ſome people eſteemed very delicate eating. The ſquaſh is generally plucked by the Americans, when it

is

is about the ſize of a walnut, and immediately after the falling of the flower.

Water-melons, or citruls, the *Anguria* of Tournefort, the *cucurbita citrullus* of Linnæus, are diſtinguiſhed by the colour of their pulp, into the white and red, and derive their name from the great quantity of water, or liquid, which they contain. Theſe fruits, by their cooling and diuretic quality, are ſo beneficial in hot climates, if uſed in moderation, that the poor people in Perſia, and the Levant, live almoſt ſolely, during the hot months, upon the muſk and water-melon, cucumbers, and milk. The water-melon, ſays Haſſelquiſt, ſerves the Egyptians for meat, drink, and phyſic: when it is very ripe, and almoſt putrid, they hollow part of it, gather the juice there collected, and mixing it with roſe water, and a little ſugar, adminiſter it in burning fevers, with ſuch ſucceſs, that the common people uſe no other medicine in thoſe diſtempers. It is not, however, from the common water-melon, that this medicine is procured. The fruit in queſtion, is ſofter, more juicy, and more rarely to be found than the common ſort, of which this is a variety. It is termed by the Arabs, et-naovi, which ſignifies water.

Water-melons ſhould be eaten with great circumſpection; for if taken in the heat of the day, when the body is very warm, they ſeldom fail to occaſion colics, fluxes, and diſorders of the ſtomach.

The common cucumber, in the eaſtern countries, is boiled and eaten with vinegar. The richer ſort fill it with fleſh and ſpices, and bake it into a pudding, which is ſaid to be extremely palatable.

The Egyptian melon, or queen of cucumbers, the *Cucumis Chate* of Linnæus, the *Abdellavi* of Alpinus, grows in the fertile earth round Cairo after the inundation of the Nile, and no where elſe in Egypt. The fruit is ſometimes ſweet, cool, and a little watery; the pulp almoſt of the ſame ſubſtance as the melon. The grandees in Egypt, and the Europeans who reſide there, eſteem this the pleaſanteſt, as well as ſafeſt fruit, which the country affords.

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The muſk-melon is diſtinguiſhed, like the water-melon, by the colour of its pulp, into the white and red ſorts; and derives its name from the fragrancy of the ſmell.

Coloquintida, or bitter-apple, the *Colocynthis* of Tournefort, the *Cucumis Colocynthis* of Linnæus, is brought to us from Aleppo, and the iſland of Crete. The leaves are large, placed alternate, almoſt round, and ſtand upon footſtalks four inches long. The flowers are white, ſucceeded by a fruit, which is yellow when ripe. The ſhelly or huſky outſide incloſes a white bitter pulp, interſperſed with white flattiſh ſeeds. If a hole is made in one of theſe ripe gourds, (for the fruit is of that kind,) and a glaſs of rum poured in, and ſuffered to remain for twenty-four hours, and then drunk, it proves a ſucceſsful purge; but is ſo bitter, and leaves ſuch a nauſea behind, that it is ſeldom uſed. It is beſides, the rougheſt purge we know, and therefore ought not to be uſed without great precaution; taken in a large doſe, it not only often brings away pure blood, but likewiſe produces colics, convulſions, ulcers in the bowels, and fatal ſuper-purgations. The Indians ſeparate or pull off the outer rind, and dry the fleſhy part of the fruit, which is what we call the Coloquintida of the ſhops.

CULMIFERÆ *Plantæ*, from *culmus*, a ſtraw, or haulm; plants ſo called which have a ſmooth jointed ſtalk, uſually hollow, and wrapped about at each joint with ſingle, narrow, ſharp-pointed leaves; and the ſeeds contained in chaffy huſks. Such are oat, wheat, barley, rye, and the other plants of the natural family of the graſſes. *Vide* GRAMINA.

CULMIFERÆ, the name of the eleventh claſs in Moriſon's Method, conſiſting of plants which agree in the general characters above enumerated.

CULMINIÆ, from *culmen*, the top, or ſummit; the name of an order in the former editions of Linnæus's Fragments of a Natural Method, conſiſting of a number of plants, moſtly of the mallow-tribe, now removed to the natural order COLUMNIFERÆ, which ſee.

CULMUS,

CULMUS, (a Καλαμη, *ſtipula*, ſtubble, non a Καλαμος, *arundo*, a reed); a ſtraw, or haulm; defined by Linnæus to be the proper trunk of the graſſes, which elevates the leaves, flower, and fruit.

This ſort of trunk is tubular or hollow, and has frequently knots or joints diſtributed at proper diſtances, through its whole length. The leaves are long, ſleek, and placed, either near the root in great numbers, or proceed ſingly from the different joints of the ſtalk, which they embrace at the baſe, like a ſheath, or glove.

The haulm is commonly garniſhed with leaves; ſometimes, however, it is naked, that is, devoid of leaves, as in a few ſpecies of cypreſs-graſs. Moſt graſſes have a round cylindrical ſtalk; in ſome ſpecies of *ſchœnus*, *ſcirpus*, cypreſs-graſs, and others, it is triangular.

The ſtalk is ſometimes entire, that is, has no branches; ſometimes branched, as in *ſchœnus aculeatus & capenſis*, and not ſeldom conſiſts of a number of ſcales, which lie over one another like tiles, (*imbricatus*.)

Laſtly, in a few graſſes, the ſtalk is not interrupted with joints, as in the greater part. The ſpace contained betwixt every two knots or joints, is termed by botaniſts *internodium*, and *articulus culmi*. *Vide* ARTICULUS.

This ſpecies of trunk often affords certain marks of diſtinction in diſcriminating the ſpecies. Thus in the genus Eriocaulon, the ſpecies are ſcarce to be diſtinguiſhed but by the angles of the *culmus*, or ſtalk. Theſe in ſome ſpecies are in number five, in others ſix, and in others ten.

CYMA, (from Κυμα, *idem quod* Κυημα, *fœtus*,—the uppermoſt tender ſhoots of herbs, particularly of coleworts); a ſpecies of receptacle, according to Linnæus; or more properly, a mode of flowering, in which, as in the umbel, a number of ſlender foot-ſtalks proceed from a common centre, and riſe to the ſame height: but, unlike the umbel, the ſecondary or partial foot-ſtalks are diſperſed without any regular order. *Vide* UMBELLA.

The term, which is of great antiquity, having been uſed, though not in the ſenſe now affixed to it, both by Columella

mella and Pliny, is exemplified in elder, gelder roſe, bloody rod, and adder's tongue.

CYMOSUS *Flos*, from *cyma*: an aggregate flower, which has the general characters juſt enumerated. *Vide* CYMA, and AGGREGATUS *Flos*.

CYMOSÆ. The name of an order in the former editions of Linnæus's Fragments of a Natural Method, conſiſting of honey-ſuckle, morinda, loranthus, and a few other genera, moſt of which are, in the later editions, removed to the forty-eighth order, intitled AGGREGATÆ.

CYNAROCEPHALI, (a *cinara* or *cynara*, an artichoke, derived from the Greek Κιναρα, *carduus*, a thiſtle, in which ſenſe it is uſed both by Dioſcorides and Athenæus, and Κεφαλη, the head), plants whoſe flowers form a head like thoſe of artichoke. The name of a claſs, or diviſion, in Vaillant's Arrangement of the Compound Flowers, correſponding to the *Capitatæ*, or flowers forming a head, of Ray, and other botaniſts; and to part of the *Floſculoſi* of Tournefort. It is exemplified in thiſtle, globe-thiſtle, burdock, ſaw-wort, and blue-bottle.

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DECAGYNIA, (from δεκα, ten, and γυνη, a woman.) The name of an order, or ſecondary diviſion, in the claſs Decandria, of the ſexual method, conſiſting of plants whoſe flowers are furniſhed with ten ſtamina, and the ſame number of ſtyles. *Neurada* and American nightſhade furniſh examples.

DECANDRIA, (from δεκα, ten, and ανηρ, a man.) The name of the tenth claſs in Linnæus's Sexual Syſtem, conſiſting of plants whoſe flowers, as the name imports, are furniſhed with ten ſtamina or male organs. This claſs, as well as the other claſſes in Linnæus's Method that are compounded with a numeral, has another character, which is not expreſſed in the title. I mean that the flowers are all hermaphrodite, that is, have both ſtamina and pointal, which,

according to our author, are the male and female organs of generation, within the same covers. In this respect, the classes in question differ from the *Monœcia*, and *Diœcia*, of the same author, in which the male and female organs are separated; being placed, in the former, upon different parts of the same plant; in the latter, upon distinct plants. This observation merits particular attention, because the circumstance, or character which is the subject of it, is indispensably necessary; and a plant having ten or any number of stamina, is not on that account to be referred to its respective numeral class, unless both male and female organs are found contained within the covers of the flower.

To take an example from the class which we are now considering: the flowers of the curious exotic, papaw, or popo-tree, have ten stamina; and yet the plant cannot be arranged under the class *Decandria*, because the male and female parts are not only placed within different covers, but likewise produced upon distinct plants: the popo seed ripened by the female flowers producing both male and female trees.

Besides the sexes of the flowers, we are likewise to attend, that the stamina be of an equal length and distinct; that is, neither joined at the bottom, nor top; circumstances which would remove the plants in which they are found, to classes whose essential character is no ways connected with the number of the male and female organs.

The orders or secondary divisions in this numerous class, are five, and take their name from the number of the styles, or female organs. Fraxinella, lignum vitæ, dwarf rose-bay, and strawberry-tree, have one style; soap-wort, and carnation, have two; cucubalus, viscous campion, and sand-wort, three; hog-plum, navel-wort, and house-leek, five; *Neurada*, and American night-shade, ten.

Decandria is likewise the name of an order or secondary division in the classes *Monadelphia*, *Diadelphia*, *Gynandria*, and *Diœcia*, in all which, the classic character being unconnected with the number of stamina, that circumstance, properly enough, serves as a foundation for the secondary or subordinate division.

DECANTHERÆ, from δέκα, ten, and *antheræ*, the tops of the filaments. The name of an order or ſecondary diviſion in Ludwig's improved Method, conſiſting of plants, which to the claſſic character, whatever it is, add the circumſtance of having ten ſtamina, or male organs.

DECIDUUS, (from *dĕcido*, to fall off, or down, to die): —Deciduous; a term expreſſive of the ſecond ſtage of duration in plants, but, like *caducus*, ſuſceptible of different ſenſes, according to the particular part of the plant to which it is applied. A leaf is ſaid to be deciduous which drops in autumn.—Petals are deciduous which fall off with the *ſtamina* and *piſtillum*; and this epithet is applied to ſuch flower-cups as fall after the expanſion and before the dropping of the flower. This laſt is exemplified in berberry, and the flowers of the claſs *Tetradynamia*. *Vide* CADUCUS and PERSISTENS.

DECOMPOSITÆ, the name of the tenth claſs in Sauvage's *Methodus Foliorum*, conſiſting of plants, whoſe leaves are twice compounded; that is, have a common foot-ſtalk ſupporting a number of leſſer leaves, each of which is compounded. *Vide* FOLIUM *Decompoſitum*.

The term is exemplified in fumatory, barren-wort, bignonia, germander, feverfew, and ſome umbelliferous plants.

DECOMPOSITI *Flores*;—ſome compound flowers ſo termed by Linnæus, which contain within the ſame common calyx, a number of leſſer or partial flower-cups, that are each of them common to many florets. The term is exemplified in elephant's foot, and globe flower. A few other compound flowers, as globe-thiſtle, *gundelia*, and *ſtoebe*, have partial flower-cups; but each of theſe contains only a ſingle floret. Linnæus reduces all the compound flowers which have partial flower-cups, under the order *Polygamia Segregata* of the claſs Syngeneſia.

DECUMBENS *Flos*, from *decumbo*, to lie down; a drooping flower, in which the ſtamina and pointal are inclined towards the lower ſide; exemplified in wild-ſena, and the pea-bloom, or butter-fly-ſhaped flowers.

DEFOLIATIO, from *de*, and *folium*, a leaf; the fall of the

the leaves. A term oppofed to *Frondefcentia*, the annual renovation of the leaves, produced by the unfolding of the buds in fpring.

Moft plants in cold and temperate climates, fhed their leaves every year. This happens in autumn, and is generally announced by the flowering of the common meadow faffron. The term is only applied to trees and fhrubs; for herbs perifh down to the root every year, lofing ftem, leaves, and all.

All plants do not drop their leaves at the fame time. Among large trees, the afh and walnut, although lateft in unfolding, are fooneft divefted of them: the latter feldom carries its leaves above five months.

On the oak and horn-beam, the leaves die, and wither, as foon as the colds commence; but remain attached to the branches till they are pufhed off by the new ones, which unfold themfelves the following fpring. Thefe trees are doubtlefs a kind of evergreens; the leaves are probably deftroyed only by cold; and, perhaps, would continue longer upon the plant, but for the force of the fpring-fap, joined to the moifture.

In mild and dry feafons, the lilac, privet, yellow jeffamine of the woods, and maple of Crete, preferve their leaves green until fpring, and do not drop them till the new leaves are beginning to appear. The fig-tree, and many other trees that grow between the tropics, are of this particular clafs of ever-greens. The trees in Egypt, fays Dr. Haffelquift, caft their leaves in the latter end of December, and beginning of January, having young leaves ready before all the old ones are fallen off; and to forward this operation of Nature, few of the trees have buds; the fycamore and willow, indeed, have fome, but with few and quite loofe *ftipulæ*, or fcales. Nature did not imagine buds fo neceffary in the fouthern, as in the northern countries; this occafions a great difference between them.

Laftly, fome trees and fhrubs preferve their leaves conftantly through the whole year: and are not in the leaft influenced by the clemency or inclemency of feafons. Such

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are the firs, juniper, yew, cedar, cyprefs, and many other trees, hence denominated ever-greens. Thefe preferve their old leaves a long time after the formation of the new, and do not drop them at any determinate time. In general, the leaves of ever-greens are harder, and lefs fucculent than thofe which are renewed annually. The trees are generally natives of warm climates, as the alaternufes of France and Italy, the ever-green oak of Portugal and Suabia.

Some herbaceous perennials, as the houfe-leeks and navel-worts, enjoy the fame privilege with the ever-green trees, and refift the feverities of winter: fome even can difpenfe with the earth for fome time; being replete with juices, which the leaves imbibe from the humidity of the atmofphere, and which, in fuch plants, are, of themfelves, fufficient for effecting the purpofes of vegetation. It is for this reafon that, unlefs in exceffive hot weather, gardeners are feldom wont to water fat fucculent plants, as the aloe, which rot when they are moiftened, if the fun does not quickly dry them up.

The leaves of all the ever-green fhrubs and trees, have a thin compact fkin or cover, over their furface; as is eafily difcovered by macerating them in water, in order to feparate the parenchyma, or pulp, from the veffels of the leaves; which cannot be effected in any of thefe ever-greens, till a thin parchment-like cover is taken off. Thefe trees and fhrubs are found by experiment to perfpire but little, when compared with others which fhed their leaves; and it is perhaps, principally owing to this clofe covering, as alfo to the fmall proportion of moifture contained in their veffels, that they retain their verdure, and continue through the winter on the trees. The nutritive juices of thefe plants always abound more or lefs with an oily quality, which fecures them from being injured by fevere frofts; fo that many of thefe ever-green trees are adapted to grow in the coldeft parts of the habitable world.

With refpect to deciduous trees, the falling off of the leaves feems principally to depend on the temperature of the atmofphere, which likewife ferves to haften or retard the

the appearance in queſtion. An ardent ſun contributes to haſten the dropping of the leaves. Hence in hot and dry ſummers, the leaves of the lime tree and horſe-cheſnut turn yellow, about the firſt of September; whilſt in other years, the yellowneſs does not appear till the beginning of October. Nothing, however, contributes more to haſten the fall of the leaves, than immoderate cold or moiſt weather in autumn; moderate droughts on the other hand ſerve to retard it. As a proof of this poſition, M. Adanſon relates, that in the year 1759, the leaves of the elm-tree, which generally fall off about the twenty-fifth of November, continued in verdure and vigour at Paris, where the autumn was remarkably dry, till the tenth of the following month.

The following table, reſpecting the mean times in which different trees ſhed their leaves, is founded upon obſervations.

Gooſeberry-tree, and Bladder-Sena,	generally quit their leaves about	October 1ſt.
Walnut and Aſh,		—— 15th.
Almond-tree, Horſe-cheſnut, and lime-tree,		—— 20th.
Maple, Hazel-nut, Black-poplar, and Aſpin-tree		—— 25th.
Birch, Plane-tree, Mountain-oſier, Falſe-acacia, Pear and Apple-tree,		November 1ſt.
Vine, Mulberry, Fig, Sumac, and Angelica-tree,		—— 10th.
Elm-tree, and Willow,		—— 15th.
Apricot, and Elder-trees,		—— 20th.

It deſerves to be remarked, that an ever-green tree grafted upon a deciduous, determines the latter to retain its leaves. This obſervation is confirmed by repeated experiments; particularly by grafting the laurel, or cherry bay, an ever-green, on the common cherry; and the ilex, or ever-green oak, on the oak.

DEHISCENTIA, *dehisco*, to gape wide. The bursting open of the *anthers* for dispersing the male-dust: as likewise of the seed-vessel called a capsule, for discharging the seeds when ripe. *Vide* ANTHERA and CAPSULA.

Most capsules split or open at top; most *anthers* burst on the sides.

DENOMINATIO, the giving or imposing of names—One of the principal foundations of practical botany; which, like the establishment of proper characters, has been a necessary consequence of the methodical division into classes, genera, and species.

Linnæus's rules, with respect to the generic and specific names of plants, and the great improvements made by that author, in this very important part of botany, are particularly mentioned under the main article, NOMINA, whither we refer the reader.

DENUDATÆ, (*denudo*, to strip naked.) The name of an order in the former editions of Linnæus's Fragments of a Natural Method, consisting of plants whose flowers are naked, that is, want the *Perianthium*, or flower-cup, although they burst from a *spatha*, or sheath. *Vide* SPATHA.

The genera in this order were four; crocus, meadow-saffron, bulbocodium, and gethyllis. They are now mostly removed to the order SPATHACEÆ, which see.

DESCRIPTIO. A description,—a detail of all the parts and qualities of any object, compared or not compared with those of another:—applied to botany, the natural character of the whole plant, including all the external parts. In this respect the description of the species is distinguished from the specific difference, which regards the essential or striking characters only.

A perfect, or complete description is not confined to the principal parts of plants, as the root, stem, leaves, and fructification; but includes, likewise, whatever is conspicuous in their external appearance: as the foot-stalks of the leaves and flower; the *stipulæ*, or scales; the *bracteæ*, or floral leaves; the glands, or vessels of secretion; the weapons of offence and defence; the buds; the complication, or fold-

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ing of the leaves within the buds; and the habit or general appearance of the whole plant.

The order to be obferved in the defcription, is that of Nature, proceeding from the root to the ftem; next the branches; then the foot-ftalks, leaves, flower-ftalks, and flowers. The impropriety would be manifeft, to defcribe the leaves, or their foot-ftalks, before the ftem, from which they proceed; or the ftem before the root, which ferves to elevate it.

Further, the defcription of each feparate part fhould be contained in a feparate paragraph; that the parts may appear equally diftinct in defcription, as they are in the plant itfelf. The names of the different parts too ought to be delineated in large letters, that they may the more eafily be difcovered by the reader; and that omiffions in the defcription, if there are any, may be more readily perceived and fupplied. Nothing, in fact, can be more tedious and unentertaining than a very large defcription, that is neither divided into paragraphs, nor diftinguifhes the parts of the plants in the manner juft recommended.

A defcription, to be complete, ought equally to avoid the extremes of prolixity and exceffive brevity. Colour, dimenfion, and other circumftances, which are fubject to change, are never to be much infifted on: on the other hand, no ftriking characters, no effential parts, however minute, fuch as the *ftipulæ*, or fcales, the *bracteæ*, the *glandulæ*, the hairs, and downy appearances on plants, and fuch like, are, from a ftudied and faulty brevity, to be excluded from the defcription of any fpecies whatever.

Laftly, a fcientific defcription fhould employ only terms of art, if thefe are fufficient; and delineate all the parts, according to their number, figure, proportion, and fituation.

The intelligent reader will difcover, whether in defcribing the feveral natural orders that occur in the courfe of this work, I have practifed the rules juft delivered. Some difference, however, obtains in the mode of defcribing an affemblage or family of plants, and a particular fpecies.

The moft complete fpecific defcriptions are thofe of Clufius,

ſius, Columna, Bauhin, Rheede, Ray, Rumſius, Plumier, Dillenius, Vaillant, Scheuchzer, Linnæus in his *Hortus Cliffortianus*, and Haller.

DETERMINATIO *Foliorum*. *Vide* FOLIUM.

DIADELPHIA, from δις, twice, and ἀδελφία, a brotherhood; two brotherhoods; the ſeventeenth claſs in Linnæus's Sexual Syſtem, conſiſting of plants whoſe flowers are hermaphrodite, and have the ſtamina, or male organs, united below into two ſets of cylindrical filaments.

This claſs, which is a true natural order or family, correſponds to the *Leguminoſæ*, or plants having pods, of Moriſon, Hermannus, Boerhaave, Ray, and Royen; the *tetrapetali irregulares* of Rivinus and Chriſtopher Knaut; the *tetrapetali difformes* of Chriſtian Knaut; and the *Papilionacei*, or butterfly-ſhaped flowers, of Tournefort and Pontedera.

The claſſical characters of this numerous and ſimilar aſſemblage of plants, will be delivered under Linnæus's Natural Order PAPILIONACEÆ, which ſee.

The orders, or ſecondary diviſions, in this claſs, are founded on the number of ſtamina, conſidered as diſtinct. Some pea-bloom, or butterfly-ſhaped flowers, have five ſtamina, or male organs, as Monnieria; ſome ſix, as Fumatory; ſome eight, as Milk-wort; ſome ten, as Broom, Bladder-Sena, Lupine, Lady's-Finger, Vetch, and the far greater number of butterfly-ſhaped flowers. It is only the laſt order that is included in the natural family *Papilionaceæ*; the remaining four genera are diſtributed among other families, to which they have, at leaſt, an equal alliance. Fumatory and *Monnieria* are arranged under the order *Corydales*; Milk-wort, under *Lomentaceæ*.

I cannot help remarking, before I conclude this article, that the names given by former botaniſts to the extenſive claſs of plants in queſtion, are much more characteriſtic of their nature and appearance, than that of *Diadelphia*.

In fact, the figure of the flowers and fruit never varies: the latter being always of the pod kind; the former of the butterfly-ſhape. On the other hand, the two ſets of united ſtamina, the only claſſic character expreſſed in the Linnæan

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title, are never to be traced without difficulty: for one of the fets only is properly united; the other confifting of a fingle filament, which, in moft plants, adheres fo clofely to its kindred fet, that it cannot be feparated without the application of a pin or needle for that purpofe. In fome even, no feparation can be effected by this means.

DIÆTETICI. By this name Linnæus diftinguifhes a clafs of Medical Botanifts, who pronounce of the qualities of vegetable food, by tafte and fmell. Such are Quercetanus, Nonnius, Behren, and Lifter.

DIANDRIA, (from δις, twice, and ανηρ, a man) the name of the fecond clafs in Linnæus's fexual fyftem, confifting of hermaphrodite plants, which, as the name imports, have flowers with two *ftamina* or male organs.

The orders in this clafs are three, derived from the number of ftyles or female parts. Moft plants with two ftamina have one ftyle, as Jeffamine, Lilac, Privet, Veronica, and Baftard Alaternus. Vernal grafs has two ftyles; Pepper, three.

DIANGLÆ, (from δις, twice, and αγγος, a veffel) the fixteenth clafs in Boerhaave's fyftem, confifting of plants whofe feeds are contained within two capfules, or within a fingle capfule having two cells. It is exemplified in purple loofe-ftrife.

DIANTHERÆ (from δις, twice, and *antheræ*, the tops of the ftamina.) The name of an order or fecondary divifion in Ludwig's Improved Method, confifting of plants, which, to the claffic character, whatever it is, add the circumftance of having two ftamina or male organs.

DICOTYLEDONES (from δις, twice; and *Cotyledon*, a feed-lobe or feed-leaf) plants whofe feeds have two fide-lobes, and confequently rife with two feminal leaves. Moft plants are of this kind. *Vide* COTYLEDONES.

In the lip and mafqued flowers, the *Didynamia* of Linnæus, and in plants, whofe feed-veffel is of the apple, cherry, or pod kind, the feed-leaves rife unaltered; that is, without any farther extenfion or developement, than when they made part of the feed.

In

In mallow, and the crofs-fhaped flowers, they appear double; in buck-wheat they are rolled up; in cotton, folded or plaited; in falt-wort, glafs-wort, ceratocarpus, malabar night-fhade, and all the pot-herbs, they are fpiral, or twifted like a fcrew.

DIDYNAMIA, (from δὶς, twice, and δύναμις, power,) two powers; the name of the fourteenth clafs in Linnæus's Sexual Method, confifting of plants with hermaphrodite flowers, which have four ftamina or male organs, two of which are long, and two fhort.

This numerous clafs of plants contains two natural affemblages or families, and confifts of flowers, which, befides the circumftance expreffed in the title, have one very irregular petal, fometimes divided into two diffimilar lips, fometimes fhaped like a mafque. From an attention to the different figure of this grinning or gaping petal, former botanifts, who, perhaps, never dreamt of the fex of plants, or, if they did, thought of nothing lefs than founding a fyftem upon it, arranged the plants in queftion under two claffes, which they confidered as having nothing in common; the number of the ftamina, and their proportion being totally difregarded. In fact, the two orders, which fubdivide the clafs Didynamia, and correfpond to the fame number of claffes in moft botanical fyftems, are fo very diffimilar, that, I believe, it would have been difficult, except from the number and proportion of the ftamina, to have reduced them under one head, with a fingle circumftance of refemblance. The petals, feed-bud, feed-veffel, and feeds, are totally different in the two orders. The habit too, or general appearance of the plants, is perfectly different; what two things, in fact, can be more diftinct than mint and bear's breech? or marjoram and fox-glove?

Linnæus himfelf is fo fenfible of the few relations that fubfift betwixt thefe two orders of plants, that, in his Fragments of a Natural Method, he is obliged to feparate them, and have recourfe to two divifions, the one from Ray, the other from Tournefort; although in the *Genera Plantarum*, he confiders the clafs *Didynamia* as having, independently of that

that expressed in the title, particular classic characters; that is, a variety of relations, which approximate the plants in that particular class to one another.

The two orders in the class Didynamia are strongly marked; being founded upon the presence or absence of the seed-vessel. Their names are borrowed from Hermannus. The order *Gymnospermia* consists of plants, which, as mint, hyssop, savory, lavender, and other aromatics, have four naked seeds lodged in the bottom of the calyx without any proper seed-vessel. These are the *Labiati*, or lip-flowers, of Tournefort and Pontedera; the *Verticillatæ*, or plants that flower at the joints, or whose flowers are placed in whirls round the stalk, of Hermannus, Boerhaave, Ray, and Linnæus in his Fragments of a Natural Method. *Vide* VERTICILLATÆ.

The second order, termed *Angiospermia*, consists of plants, whose seeds, as the name imports, are lodged in a pericarpium or seed-vessel. To this order belong fig-wort, fox-glove, bignonia, eye-bright, toad-flax, calve's snout, oily purging grain, agnus castus, bear's breech, and several others. *Vide* ANGIOSPERMIA.

These plants are the *Personatæ* or masqued flowers of Tournefort, and make part of the third class in his system. Under the same name Linnæus arranges them in his Fragments of a Natural Method. *Vide* PERSONATÆ.

Professor Royen, in his Floræ Leydensis Prodromus, has traced the outlines of what he calls a natural method, in which we find the class *Didynamia* of Linnæus distinguished as one entire natural family or order, under the name *Ringentes*, or the grinning flowers. As I never suffer my admiration for any man, however distinguished, to betray me into the fatal complaisance of adopting his errors; I must beg leave to differ from both the learned doctors, and to consider the class *Didynamia*, as composed of two natural orders of plants, that have not the least affinity together.

The lip flowers, which constitute the first order, are described under the article VERTICILLATÆ; those with a masque, which constitute the second, under PERSONATÆ.

DIFFORMIS *flos* (from δις, twice, and *forma*, a form) having

having two different forms, irregular; the term is expreſſive of the inequality and irregularity of the petals. It is uſed by Jungius and Chriſtian Knaut; and is ſynonimous to the *Anomalus flos* of Tournefort and Pontedera, the *Irregularis flos* of Rivinus, and the *Corolla irregularis* of Linnæus.

The term is exemplified in the maſqued flowers, aconite, columbine, violet, fumatory, lark-ſpur, orchis, and other plants in which the petals are very irregular and diſſimilar.

DIFFORMIS is the name of a ſeries of claſſes in Chriſtian Knaut's Method, conſiſting of plants which have one or more irregular petals. Among many others, theſe claſſes comprehend all the grinning and pea-bloom flowers; they correſpond to the diviſion in Rivinus's method, termed *Irregulares.*

DIGYNIA (from δις, twice, and γυνη, a woman). The name of an order or ſecondary diviſion in each of the firſt thirteen claſſes, except the ninth, in Linnæus's Sexual Method; conſiſting of plants, which to the claſſic character, whatever it is, add the circumſtance of having two ſtyles or female organs.

DIŒCIA (from δις, twice, and οικια, a houſe or habitation,) two houſes. The name of the twenty-ſecond claſs in Linnæus's Sexual Method, conſiſting of plants, which, having no hermaphrodite flowers, produce male and female flowers on ſeparate roots. Theſe latter only ripen ſeeds, but require, for that purpoſe, according to the Sexualiſts, the vicinity of a male plant, or the aſperſion of the male duſt. From the ſeeds of the female flowers are raiſed both male and female plants.

The plants then in the claſs Diœcia, are all male or female; not hermaphrodite as in the greater number of claſſes; or with male and female flowers upon one root, as in the claſs *Monœcia* of the ſame author.

Accurate as the Swediſh Botaniſt undoubtedly is, there are many plants diſperſed through the different claſſes in the *Genera Plantarum*, which have male and female flowers on diſtinct roots, and therefore ought, in ſtrict propriety, to have been reduced under the claſs *Diœcia.* Linnæus, ſen-

ſible of the weak ſide of his ſyſtem, has endeavoured to anticipate and deſtroy the force of this criticiſm, by inſinuating that ſuch plants could not properly enter into this claſs, becauſe the circumſtance alluded to does not run through the genus, but is peculiar to ſome particular ſpecies only. To an unexperienced botaniſt the reaſon is ſatisfactory; but examined with attention, it is reſolved into a mere begging of the queſtion; for, if the ſex of plants be a doctrine of ſuch importance in botany, as to juſtify the joining together of things which Nature never joined, and the ſeparation of others which were never meant to be disjoined; it certainly authorized the great reformer of the ſcience to erect ſeveral genera out of one, eſpecially when the leading principles of his ſyſtem required it. The liberties he has taken with the genera of Ray, Tournefort, Boerhaave, and other eminent botaniſts, are well known. In fact, what a perplexed ſtudy is Botany now rendered, by the prodigious multiplication of ſynonimous genera! To whom then is this mighty confuſion owing? Why, in a great meaſure, to Linnæus, who, by ſplitting ſome genera, incorporating others, and introducing a variety of new names, has rendered every other ſyſtem unintelligible, without the aſſiſtance of his nomenclature.

When ſuch a renovation of the genera was to take place, where would have been the impropriety of making diſtinct genera of moſt of, or all the ſpecies, to be afterwards enumerated, when they could not be conſidered as mere ſpecies without infringing the fundamental laws of his ſyſtem? To take an example; a ſpecies of campion, the lychnis of Linnæus, bears male and female flowers on ſeparate plants. I ſhall ſuppoſe that, with the aſſiſtance of the *Genera Plantarum*, or *Syſtema Naturæ*, I would explore the claſs, order, genus, and ſpecies of a plant of the male lychnis, which, by chance, I have found in the fields. To determine the claſs, I reckon the number of ſtamina; which finding to be ten, of an equal length, and united neither above nor below, I am almoſt ready to refer my plant to the tenth claſs, *Decandria*, when I reflect, that, beſides the characters

juſt

Lychnis Dioica.
Phytolacca Dioica.
Spiræa Aruncus.
Rubus Chamæmorus.
Clematis Virginiana.
——— Dioica.
Thalictrum Dioicum.
Napæa Dioica.
Gnaphalium Dioicum.
Gypsophila paniculata.
Phylica Dioica.

The three following species are improperly referred by Linnæus to the class *Monœcia*, which contains plants with male and female flowers upon the same root.

Carex Dioica.
Urtica Dioica.
Morus Nigra.

It is worthy of observation, that not a single species in the rough-leaved plants of Ray, and the lip, masqued, cross-shaped, and pea-bloom flowers of Tournefort is found to differ in point of sex. These are true natural assemblages, accurately defined by fixed and precise characters. For the same reason we have been able to trace but one deviation of Nature in the compound flowers; I mean, in a species of cud-weed. As deviations, however, or exceptions to the general law of their nature, I would remove all such species from a class or order, in which, at best, they appear but as vegetable monsters; and either place them apart in an appendix to the work, under the title of Anomalous, that is, irregular plants which do not commodiously arrange themselves under any of the foregoing classes, as Ray, Tournefort, and other eminent botanists have done: or refer each species as a genus, if necessary, to the particular class, to which, in strict conformity to the principles of the system, it can only belong.

The orders in the class *Diœcia* are fourteen, founded upon the number, union and situation of the stamina in the male

male plants: their names are thofe of the claffes containing hermaphrodite flowers. *Najas* has one ftamen or male organ; willow, two; poets cafia, three; miftletoe, and fea-buckthorn, four; piftacia-nut, fpinach, and hop, five; rough bindweed (Smilax) and *Diofcorea*, fix; poplar, and rofe-root, eight; mercury, nine; papaw, and Indian maftick, ten; moonfeed, and baftard-hemp, twelve. In *Cliffortia*, the ftamina are numerous; in juniper, yew, and fhrubby horfe-tail, they are united by their filaments into a pillar; in butcher's-broom, they are united by the *anthers* or tops; and in *Clutia*, fays Linnæus, they are attached to the middle of a very long cylindrical ftyle in the centre of the male flowers. Here is another impropriety; the very name of the order under which *Clutia* arranges, (*Diœcia Gynandria*) is abfurd. For if a genus of plants be truly *diœcious*, that is, contain male and female plants on different roots, the ftamina of the male flowers cannot be inferted into the ftyle or female organ, becaufe fuch female organ is not prefent. On the other hand, if the female organ, or any of its parts, be prefent and confpicuous, the plant is not *diœcious*, but hermaphrodite. In the clafs *Monœcia*, which contains plants with male and female flowers on the fame root, the order in queftion again occurs, and with equal impropriety as in the prefent cafe. Baftard orpine, (Andrachne) the fingle genus in that order, is nearly allied to *Clutia* in the clafs *Diœcia*.

DIPETALI (from δις, twice, and πεταλον, a petal,) having two petals; the name of two claffes in Rivinus's method, confifting of regular and irregular flowers with two petals. Enchanter's night-fhade and *Commelina* furnifh examples.

DIPSACEI, (from *Dipfacus*, teafel); the name of an improper divifion in Vaillant's Arrangement of the Compound Flowers, confifting of plants, whofe flowers, like thofe of teafel and fcabious, form a head, and are contained within a common calyx. Thefe plants differ from the Compound Flowers of Linnæus, in having their ftamina free, or diftinct both at bottom and top: the partial flowers too are frequently furnifhed with a proper calyx. They correfpond to

 Linnæus's

Linnæus's aggregate flowers properly so called. *Vide* AGGREGATUS *flos*. Besides those already mentioned, viburnum, honey-suckle, and valerian furnish examples.

DISCOIDEÆ, (from *Discus*, the middle of a radiated compound flower) the name of a class in Ray's method, which includes a great part of the *Radiati* of Tournefort. A radiated discous flower has several semi-florets placed in the circumference like so many rays round the disk; such are groundsel, feverfew, aster, golden rod, daisy, and many others.

A naked discous flower has no rays or semi-florets in the circumference, as cudweed, foreign colt's-foot, *Cotula*, and ploughman's spikenard.

DISCOIDEÆ, is likewise the name of division in Linnæus's Arrangement of the Compound Flowers.

DISCUS, (Gr. Δισκος, *discus*, a quoit, dish, and from its flat and round appearance, the circumference of the sun.) This term in the modern Botanical Nomenclature signifies the centre of a radiated compound flower, and generally consists of small florets with a hollow regular petal. It is commonly surrounded by large, flat, tongue-shaped petals in the circumference or margin; as in daisy, groundsel and leopard's bane; sometimes the circumference is naked, as in cotton-weed, and some species of colt's-foot.

DISCUS *folij*, the whole surface of the leaf.

DISSEMINATIO. The various and wonderful contrivances of Nature to disperse and scatter abroad the seeds of vegetables, for the purposes of increase. For particulars on this curious subject, the reader is referred to the article SEMEN.

DISSEPIMENTUM, (from *Sepes*, a hedge.) By this name Linnæus denominates the partitions, which, in dry seed-vessels, as capsules and pods (Siliqua) divide the fruit internally into cells.

DODECANDRIA (from δωδεκα, twelve; and ανηρ, a man.) The name of the eleventh class in Linnæus's Sexual System; consisting of plants with hermaphrodite flowers, that, according to the title, have twelve stamina or male

 organs.

organs. This claſs, however, is not limited with reſpect to the number of ſtamina. Many genera have ſixteen, eighteen, and even nineteen ſtamina; the eſſential character ſeems to be that, in the claſs in queſtion, as in *Polyandria*, the 13th, the ſtamina are inſerted into the receptacle: whereas in the intermediate claſs, *Icoſandria*, which is as little determined in point of number as the other two, they are attached to the inſide of the calyx.

The orders in this claſs, which are ſix, are founded upon the number of the ſtyles, or female organs. Aſarabacca, mangoſtan, ſtorax, purple looſe-ſtriſe, wild Syrian rue, and purſlane, have one ſtyle; agrimony and heliocarpus have two; burning thorny plant, and baſtard rocket, three; *Glinus*, five; *Illicium*, eight; and houſeleek twelve.

DODRANS, a term of meaſure. *Vide* MENSURA.

DRUPA, and DRUPPA, (uſed by Pliny for an olive waxing black with ripeneſs, and ready to fall off the tree); a ſpecies of ſeed-veſſel that is ſucculent, has no valve or external opening like the capſule and pod, and contains within its ſubſtance a ſtone or nut. The cherry, plumb, peach, apricot, and all ſtone fruit, are of this kind.

The term, which, as we have ſeen, is of great antiquity, is ſynonimous to Tournefort's "fructus mollis oſſiculo," ſoft fruit with a ſtone; and to the *Prunus* of other botaniſts.

The ſtone, or nut, which, in this ſpecies of fruit, is ſurrounded by the ſoft pulpy fleſh, is a kind of woody cup, containing a ſingle kernel or ſeed, (Nucleus.)

The reader will be miſtaken, if he imagines that the definition juſt given will apply to every ſeed-veſſel denominated *Drupa* in the *Genera Plantarum*. The almond is a *Drupa*, ſo is the ſeed-veſſel of the elm tree and the genus *Rumphia*; though far from being pulpy or ſucculent, the firſt and third are of a ſubſtance like leather; the ſecond like parchment. The ſame may be ſaid of the walnut, Piſtacia-nut, *Guettarda*, *Quiſqualis*, jack-in-a-box, and ſome others.

Again, the ſeeds of the elm, *Schrebera*, *Flagellaria*, and the mango-tree, are not contained in a ſtone. The ſeed-

veſſel

veſſel of burr-reed is dry, ſhaped like a top, and contains two angular ſtones.

This ſpecies of fruit, or more properly ſeed-veſſel, is commonly roundiſh, and, when ſeated below the calyx, or receptacle of the flower, is furniſhed, like the apple, at the end oppoſite to the foot-ſtalk, with a ſmall umbilicus or cavity, produced by the ſwelling of the fruit before the falling off of the flower-cup.

DRUPACEÆ (from Drupa) an order of plants in the former editions of Linnæus's Fragments of a Natural Method, conſiſting of the almond, peach, plumb, apricot, cherry, and bird-ſeed, which have that ſpecies of fruit-veſſel called by Linnæus, *Drupa*. *Vide ſupra.*

Theſe plants are now reduced to two genera, *Amygdalus* and *Prunus*, and make part of the natural order POMACEÆ, which ſee.

DUMOSÆ, (from Dumus, a buſh) buſhy plants; the name of the forty-third order in Linnæus's Fragments of a Natural Method; conſiſting of a number of ſhrubby plants, which are thick ſet with irregular branches, and buſhy.

Liſt of the Genera *contained in this Natural Order.*

SECTION I.

Thickſet buſhy Shrubs, with Leaves placed alternate.

Linnæan Genera.			English Names.
Achras,	—	—	Sapota.
Caſſine,	—	—	Caſſioberry-buſh, and South-Sea or Paraguay tea.
Ceanothus,	—	—	New-Jerſey tea.
Celaſtrus,	—	—	Staff-tree.
Chryſophyllum,	—	—	Star-apple, and damſon-tree.
Fagara.			
Ilex,	—	—	Holly.
Phylica,	—	—	Baſtard alaternus.

Prinos,

Linnæan Genera.	English Names.
Prinos, —	— Winter-berry.
Rhamnus, —	— Buckthorn, alaternus, jujube-tree.
Rhus, —	— Sumach, poiſon-tree, Varniſh-tree.
Schinus, —	— Indian maſtick.
Sideroxylon, —	— Iron-wood.

SECTION II.

Thickſet buſhy Shrubs, with Leaves placed oppoſite.

Callicarpa, —	— Johnſonia.
Euonymus, —	— Spindle-tree.
Sambucus, —	— Elder.
Tomex.	
Viburnum, —	— Pliant mealy-tree, or way-faring tree, lauriſtinus and gelder-roſe.

Habit and Structure of the Plants of this Order.

The plants of this order are all of the ſhrub and tree kind, thick and buſhy, and riſe from ſix to twenty-five, thirty, and even forty feet high. Many of them too, as baſtard alaternus, holly, iron-wood, new-jerſey tea, ſtar-apple, viburnum, winter-berry, and ſome others, retain their beautiful leaves during the whole year.

The ROOTS are branched and fibrous.

The STEMS are cylindric; the young branches ſometimes angular.

The BUDS are naked, that is, without ſcales, in the evergreen ſhrubs of this order; covered with ſcales in moſt of the others.

The LEAVES, which in ſome genera are ſimple, in others compound, are placed alternate in plants of the firſt ſection; oppoſite, in thoſe of the ſecond. In caſſioberry-buſh, ſome of the leaves are almoſt oppoſite.

From the baſe of the leaf of the gelder-roſe, a ſpecies of

viburnum, proceed a number of ſmall glands or ſecretory veſſels.

Holly, elder, and ſpindle-tree have two STIPULÆ or ſcales, one on each ſide of the branches; in the two laſt they are ſlender like hairs, and almoſt imperceptible.

The branches of ſtaff-tree, and of ſome of the ſpecies of *Rhamnus*, are terminated by a thorn, which diſappears by culture. Jujube tree, and Chriſt's-thorn, two other ſpecies of *Rhamnus* have, at both ſides of the origin of the footſtalk of the leaves, two unequal ſpines; the one of which is erect and large; the other, ſmaller and curves downwards.

In *Fagara* there are placed along the branches, and ribs of the leaves, a number of prickles, which being ſlightly attached to the bark of the plants, fall off quickly. In holly, the leaves are thorny.

The leaves and branches of the genus *Tomex* are covered with ſoft downy hairs, which have a ſilver-white appearance. This kind of pubeſcence is termed *tomentum*, whence the genus derives its name.

The FLOWERS are moſtly hermaphrodite. Indian maſtick, and ſome ſpecies of buck-thorn and ſumach, have male and female flowers upon different roots: holly too, ſtaff-tree, *fagara*, and alaternus, a ſpecies of buck-thorn, ſometimes produce male flowers on one root, and hermaphrodite flowers on another; the laſt has ſometimes male and female flowers on the ſame root.

The flowers proceed from the angles of the leaves, either ſingly, as in winter-berry; or in cluſters, as in buck-thorn, johnſonia, caſſioberry-buſh, and iron-wood; or they terminate the ſtem in that ſort of flowering head called a CORYMBUS; as in baſtard alaternus.

The CALYX is generally very ſmall, placed below or around the ſeed-bud, and conſiſts of one leaf, with four, five, or ſix diviſions, which are permanent, that is, accompany the ſeed-bud to its maturity. The genus *Rhamnus* has no calyx. In ſapota, it is compoſed of ſix diſtinct leaves. In elder and viburnum, it is placed above the ſeed-bud.

The PETALS are, in number, from one to five; in buck-

thorn

thorn and ſapota, five ſcales, which ſerve for a *nectarium*, are inſerted into the chaps (*faux*) of the tube of the petal.

The STAMINA are either four, as in johnſonia and holly; five, as in ſumach, ſpindle-tree, and the greater number of plants in this order; ſix, as in ſapota and winter-berry; or ten, as in Indian maſtick.

The SEED-BUD is generally roundiſh, and placed within the flower; in elder and viburnum it is placed below it.

The STYLE is generally ſingle, and ſometimes wanting, as in Indian maſtick, ſumach and viburnum: the latter, as well as the elder, has a gland or veſſel of ſecretion, in its place.

The STIGMA, or ſummit of the ſtyle, is either ſingle, as in iron-wood and buckthorn; or triple, as in ſumach, viburnum, caſſioberry-buſh, and elder.

The SEED-VESSEL in this order is generally a berry; ſometimes a dry capſule, as in ſpindle-tree and baſtard alaternus: in iron-wood, the ſeed-veſſel is of the cherry kind; in ſapota, of the nature and ſubſtance of an apple.

The SEEDS are generally ſingle and egg-ſhaped. In the ſpindle and ſtaff-trees, they are wrapped up in a proper coat or *arillus*. *Vide* ARILLUS.

Theſe plants have no ſtriking claſſical character; I have, however, after the example of Linnæus, conſidered them as a natural order, though their relations are not ſo numerous as ſtrictly to entitle them to that appellation.

The berries, bark, and flowers of many of theſe plants are purgative, and act particularly on the lymph and bile.

Sapota, ſometimes called Mammee Sapota, is very common in the Weſt India iſlands, where the trees are planted in gardens for the fruit, which, by many perſons, is much eſteemed. The flowers, which are of a cream colour, are ſucceeded by an oval top-ſhaped apple covered with a browniſh huſky ſkin, under which is a thick pulp, of a ruſſet colour, and very luſcious taſte, including one or two hard oval nuts or ſtones. It is called Natural Marmalade, from

from its resemblance in taste to marmalade of quinces. The stones or kernels of this fruit, taken in emulsion, are a powerful aperient, and reckoned specific in gravelly complaints.

The leaves of Johnsonia, which grows plentifully in South Carolina, are used with success in dropsical cases.

A decoction of the root of *Ceanothus Americanus*, or New-Jersey tea, is esteemed a certain remedy, not only in slight gonorrhœas, which it stops in two or three days without any bad consequences; but also in the most inveterate venereal complaints. A large vessel must be employed in this decoction, because the plant, in the time of boiling, throws up a great quantity of froth, which must not be lost. The inhabitants of North America, where this shrub naturally grows, dry the young leaves and infuse them in water like tea; whence the name of New-Jersey tea, by which title the seeds are generally brought into Europe.

The root of the staff-tree, being powdered, is used by the negroes of Senegal as a specific against gonorrhœas, which it is said to cure in eight, and sometimes at the end of three days. An infusion of the bark of a species of staff-tree, which grows in the isle of France, is said to possess the same virtues.

Star-apple is garnished with oval leaves that are smooth above, and of a beautiful gold colour, shining like satin on their under side; whence the name Chrysophyllum or golden leaf, by which it is known among botanists.

The wood of the spindle tree is yellow, and used in works of sculpture. By the musical instrument makers it is employed for toothing of organs and virginal keys. The branches are cut into tooth-picks and skewers, and spindles are made of the wood, whence the tree derives its title. In some countries, says Miller, it is called dog-wood.

From the *arillus*, or proper covering of the seeds of the spindle-tree, is drawn a very beautiful red tincture. The powder of the capsules, sprinkled upon the head and cloaths is said to destroy lice and other vermin.

The capsules, or dry seed-vessels of the genus fagara, are used by the Africans for pepper.

Iron-

Iron-wood is ſo called from its great weight, its hardneſs, and the cloſeneſs of its grain; for it is proof againſt all weather, and ſcarce known to ſuffer any decay in ſeveral ages; it is ſo heavy, that it will ſink in water.

Of the bark of common holly is made the common bird-lime, which is better than that made of miſletoe. The wood is very white, and admits of an exceeding fine poliſh. It is chiefly made into hones for whetting of razors.

The berries of narrow-leaved ever-green privet, the *Rhamnus Alaternus* of Linnæus, the alaternus anguſtifolia of Tournefort, are ſold in France by the name of Avignon-berries for the uſe of painters, who prepare from them a yellow colour or pigment. Theſe berries are, by ſome, erroneouſly imagined to be the fruit of the dwarf buckthorn, or *Rhamnus Catharticus Minor*.

The Egyptian thorn, the œnoplia ſpinoſa of Caſpar Bauhin; the nabca paliurus athenæi of Proſper Alpinus; the naba or nabka of the Arabians; and the rhamnus ſpina chriſti of Linnæus; is ſuppoſed, by many travellers, to be the tree from which the crown of thorns that was put on the head of our Saviour, was made. It is very common in the eaſtern countries, particularly in Paleſtine. This plant, ſays Haſſelquiſt, was very proper for the purpoſe to which it is ſuppoſed to have been applied, as it has many ſmall ſharp ſpines, or thorns, well adapted to give pain. The crown, too, might be eaſily made of the ſoft, round and pliant branches with which this tree or hedge is furniſhed. What in Haſſelquiſt's opinion ſeems to be the greateſt proof of the ſuppoſed uſe of this plant, is, that its leaves have a great reſemblance to thoſe of ivy, with which emperors and generals were wont to be crowned. The enemies of Chriſt would, perhaps, deſire to have a plant ſomewhat reſembling that which was uſed in triumphs and times of feſtivity, that there might be calumny and reproach even in the puniſhment.

Syrup of buckthorn, which is prepared of the berries of the purging or common buckthorn, is reckoned a good medicine in the dropſy, jaundice, itch, and other eruptions of

the ſkin. It is of a very diſagreeable bitterneſs, cauſes thirſt, and is proper for ſuch as are eaſy to work upon, and whoſe ſtrength has not been impaired by continual diſeaſes. The berries may be eaſily known by counting their ſeeds, which are four in number; and, by rubbing the juice upon white paper, which it ſtains of a green colour.

Of the juice of theſe berries the French prepare a beautiful green pigment or colour, known among painters by the name of Verd-de-veſſie.

Half an ounce of an infuſion of the inner bark of the berry-bearing alder, the *Rhamnus Frangula* of Linnæus, or a dram of the powder, proves as violent a purge as rhubarb. The berries are often brought to market, and impoſed upon the ignorant for buckthorn-berries. They may, however, be eaſily diſtinguiſhed; the berries of buck-thorn having generally four ſeeds; thoſe of frangula, but two.

Jujube, which Linnæus has joined along with alaternus, berry-bearing alder, and Chriſt's thorn, to his genus *rhamnus*, by the name of *rhamnus Zizyphus*, is a native of the warm parts of Europe, particularly the ſouth of France, and Italy, having been tranſported thither from Syria, as Linnæus obſerves, by Sextus Pampinius, in the time of the emperor Auguſtus. The fruit, which is about the ſize of a plumb, is reckoned pectoral, warm and moiſtening; it has an agreeable taſte, though ſomewhat inſipid, and was formerly uſed in ptiſans and pectoral apozems; but is now ſeldom to be found in the ſhops. In Italy and Spain, jujubes are ſerved up in deſſerts as a dry ſweet-meat, during the winter ſeaſon.

A decoction of the roots and branches of the common jujube is ſaid to be ſucceſsful in venereal complaints.

The branches and leaves of the elm-leaved ſumach, or *Rhus Coriaria* of Linnæus, are uſed inſtead of oak-bark for the tanning of leather; the Turkey leather is ſaid to be all tanned with this ſhrub. The leaves, berries, and ſeeds of this ſpecies of ſumach, are uſed in medicine; they are aſtringent, refreſhing and antiſeptick; the berries are uſed in decoction for ſtopping fluxes and violent hæmorrhages.

Virginian

Virginian ſumach is covered with a fine ſoft velvet down; the young branches reſemble, both in colour and texture, a ſtag's horn; by which appellation it is generally known among the inhabitants of North America. This ſort is likewiſe uſed for tanning leather: and the roots, ſays Miller, are often preſcribed in medicine, in the countries where the tree naturally grows.

Very good vinegar is made of the infuſion of the fruit of an American ſpecies of ſumach, which, for that reaſon, is generally known by the name of vinegar-tree. Venice, or red ſumach, the *Rhus Cotinus* of Linnæus, is more uſed by the curriers than in phyſic; it is ſaid, however, to be vulnerary and aſtringent; the wood dyes a fine yellow colour.

Moſt ſpecies of ſumach abound with a white milky juice, which is reckoned poiſonous: that of *Rhus Vernix*, or poiſon-aſh, is eſteemed for its quality of ſtaining; and the plant, from that circumſtance, adjudged to be the true varniſh-tree, deſcribed by Kæmpfer in the Amœnitates Exoticæ, by the name of Sitz-dſin.

This tree, the *Toxicodendron foliis alatis, fructu rhomboide* of Dillenius, the poiſon-tree of Kalm, riſes with few branches to the height of a willow, and grows naturally in Japan and North America. The bark is hoary, rough with warts, and eaſily parts from the wood, which is very brittle, and reſembles that of willow. The pith is copious. The ſhoots are long, thick, and covered at the extremity with leaves placed without order. Theſe are winged with an odd one. The lobes, pinnæ, or leſſer leaves, are ſlender, egg-ſhaped, of a dark green, ſmooth on the upper ſurface, hoary below, and ſtand oppoſite upon very ſhort footſtalks. The juice contained in the leaf being rubbed upon paper, immediately tinges it with an iron colour. The flowers proceed in cluſters from the arm-pits of the leaves. Theſe cluſters are looſely branched, and ſlender, being compoſed of ſmall yellow flowers, of a ſweet and very grateful ſmell, ſomewhat reſembling that of the flowers of the orange-tree. The fruit is bunched, compreſſed into a rhomboidal

rhomboidal figure, covered with a thin ſhining membrane, and very hard when ripe.

The bark of varniſh-tree being notched with a knife, effuſes a milky ſubſtance, mixed with a chryſtalline humour exuding from other ducts, which blackens by the admiſſion of air. This ſubſtance, which is likewiſe produced from the branches, pedicles and ribs of the leaves, has no perceptible taſte, unleſs a little heat without any acrid ſenſation. The tree, however, it is affirmed, emits poiſonous exhalations ſo exceeding ſtrong, as to produce in boys who play about it violent inflammations in different parts of the body—effects which, in others, have attended the handling of the wood. They collect the varniſh, by wounding the trunks of the trees (generally thoſe of the age of three years) with a few notches, or gentle inciſions; from which the liquor flowing is received into veſſels placed there for that purpoſe: the inciſions being repeatedly continued in freſh places, till the tree is left wholly without juice. It is then cut down to the root, which quickly yielding a new offspring, is, at the end of three years, again ſubjected to a new inciſion for the collection of more varniſh.

Japan produces the nobleſt and moſt precious varniſh, but in ſo ſmall a quantity, that it would not even ſuffice for their own uſe, without the aſſiſtance of a more ignoble ſpecies brought from Siam, and termed Nam-Rak, which ſerves as a foundation to the other. The tree which furniſhes the inferior ſort is the anacardium produced in the province Corſama, and in the kingdom of Cambodia. The trunks being perforated, and a tube inſerted to receive it, the liquor is produced in ſuch abundance as ſuffices for ſtaining the utenſils of China, Tonquin, and Japan. Varniſh of Japan, after being collected from the tree, as above-deſcribed, is filtrated through a double fold of paper almoſt as thin as a ſpider's web, and ſingularly conſtructed for that purpoſe. The intention of this proceſs is to cleanſe the ſubſtance from all thick and heterogeneous particles. When thoroughly cleaned, a little of the oil named Toi, expreſſed from the fruit of the tree kiri, is mixed with it. It is then put

put into wooden veſſels, and carried through Japan to be ſold. Both ſpecies of varniſh, that of Japan and that of Siam, emit a poiſonous exhalation, which ſwells the lips, and gives the head-ach; for which reaſon the artificers in putting it on, bind their mouth and noſtrils with a napkin.—— See Kæmpfer's Amœnitates Exoticæ, p. 791.

Spurious Varniſh-Tree, the *Arbor vernicifera ſpuria ſylveſtris anguſtifolia* of Kæmpfer, the *Rhus ſuccedanea* of Linnæus, grows naturally in China and Japan, and is diſtinguiſhed from the true varniſh-tree, which it greatly reſembles, chiefly by the narrowneſs of the pinnæ of the leaves, and by the ſize of the fruit, which is as large as a cherry; whilſt in the true varniſh-tree, the pinnæ are broader, and the fruit, which is altogether white, (another circumſtance of diſcrimination) is about the bigneſs only of a pea. The true varniſh-tree, obſerves Kæmpfer, is ſaid to be changed into this wild or ſpurious kind, if planted in a barren ſpot, and its culture neglected. He adds, that he has ſeen ſome plants, the leaves of which fluctuated ſo remarkably betwixt both ſorts, that even the natives were at a loſs whether they ſhould, or ſhould not, be reckoned of the true kind. This tree emits its varniſh ſo very ſparingly, that it is ſcarce worth while to collect it. The fruit of both ſpecies of varniſh tree, the true and the ſpurious, being beat and boiled, together with the berries of the ſanders-tree, and put hot under a preſs, leave a juice which the Japaneſe employ in making candles, as they do likewiſe what is expreſſed from the berries of two ſpecies of laurel, termed by them Taab and Tſuns. Kæmpferi Amœnitat. Exot. 794.

From the handling, or even breathing in the atmoſphere of other poiſonous ſpecies of ſumach, effects equally unpleaſant are produced as thoſe deſcribed above. The exhalations, in particular, of *Rhus radicans* and *Toxicodendrum*, which, by the way, have no great reſemblance to the ſumachs, the leaves not being pinnated, but growing by threes, as in trefoil, (*ternata*,) are ſaid to occaſion ſmall red ſpots on the ſkin, not unlike thoſe eruptions vulgarly known by the name of St. Anthony's Fire. The ſlighteſt touch of the leaves produces

produces very violent itchings, which are ſometimes followed by an inflammation and ſwelling. If the juice of any ſpecies of poiſon-tree is ſuffered to remain but for a few minutes on the ſkin, it occaſions puſtules, which are ſometimes miſtaken for the itch. The wood when burnt, emits a very noxious fume, which is ſaid to ſuffocate animals that are expoſed to it. When expoſed to the heat of the ſun, the juice becomes ſo reſinous and clammy, that it proves a good bird-lime, and is uſed with great ſucceſs for that purpoſe. A cataplaſm of the newly extracted juice of a ſpecies of poiſon-tree, mentioned by Hughes in his Natural Hiſtory of Barbadoes, applied to the feet, is ſaid to kill the vermin, called by the Weſt-Indians chigers.

The Americans, it is ſaid, pretend to diſtinguiſh the poiſon-aſh, (*Rhus Vernix*) by the touch in the dark, from its extreme coldneſs.

From the *Rhus Copallinum* of Linnæus, the *Rhus Virginianum lentiſci foliis* of Ray, is produced Gum Copal, an excellent balſam, equal in goodneſs to that of Peru. The animals which are wounded by hunters in Louiſiana, Florida, and Virginia, cure themſelves, we are told, by rubbing againſt the tree from which this balſam exudes, attracted thereto, probably, by its pleaſing aromatic ſmell.

The Natives of Louiſiana and Florida toaſt the ſmall leaves of *Prinos glaber*, termed by Cateſby the true Caſſine or Caſſena, as we do coffee, and drink the infuſion of them with much ceremony. This the Indians call the Liquor of Valour. It is an excellent diuretic; but when taken in great quantity, or made too ſtrong, which, from their attachment to this beverage, is frequently the caſe, excites a kind of convulſions, which are not productive, however, of any ſerious inconvenience.

The bark, leaves, flowers and berries of the common elder are uſed in medicine. An infuſion of the inner bark in milk, wine, or water, is a gentle purgative; the leaves, which are of a bitter taſte, are outwardly applied in fomentations for the piles. The flowers infuſed in whey are beneficial in diſorders of the ſkin, and afford a vinegar, which

is

is leſs hurtful to the ſtomach than common vinegar. From the berries, beſides a rob and extract, are prepared a ſpirit, a wine, and an oil, which promote urine, perſpiration, and ſweat. The whole plant has a diſagreeable and almoſt nauſeous ſmell. The leaves and ſtalks are ſo bitter, that few animals will brouze upon them.

The juice of the dwarf elder, the ſambucus ebulus of botaniſts, is recommended in dropſical caſes. The root is bitter, ſomewhat acrid and nauſeous; the inner bark of the root is ſtrongly purgative; the pith, or internal ſubſtance, is more aſtringent than the reſt of the plant; the berries and ſeeds are a gentle purge. The whole plant exhales a ſtrong and diſagreeable odour; and is, on that account, frequently placed round granaries, to drive away rats and other vermin.

The ever-green caſſine, otherwiſe called Paraguay, or South-ſea tea, Linnæus has confounded with the Carolina or Dahoon holly; though they are undoubtedly diſtinct plants.

This ſpecies of caſſine, which grows naturally in Carolina and Virginia, is called yapon by the natives of thoſe countries. The berries are of a beautiful red colour, and as they continue moſt part of the winter upon the plants without being touched by the birds, we may reaſonably conclude that they are poſſeſſed of a poiſonous quality, as few of the wholeſome innocent fruits eſcape their depredations. The Indians, however, have a great veneration for this plant, and come in great numbers, at certain times of the year, to fetch away the leaves. On ſuch o:caſions, their uſual cuſtom, ſays Miller, is to make a fire upon the ground, and putting on it a great kettle full of water, they throw in a large quantity of yapon leaves; and, when the water has boiled ſufficiently, they drink large draughts of the decoction out of the kettle, which ſeldom fails to act as a powerful emetic. In this manner, notwithſtanding, they continue drinking and vomiting for the ſpace of three days, until they have ſufficiently cleanſed themſelves; they then gather every one a bundle of the ſhrub, and carry it home with them.

In the operation of theſe leaves by vomiting, ſay thoſe

who have taſted of them, there is no uneaſy ſenſation or pain. The matter diſcharged comes away in a full ſtream from the mouth without any violence, or ſo much as diſpoſing the patient, if he may be called ſo, to retch, or decline his head. The Spaniards who live near the gold mines in Peru, are frequently obliged to drink an infuſion of the herb paraguay, which is generally ſuppoſed to be the evergreen caſſine, in order to moiſten their breaſt. Without this relief, they are liable to a ſort of ſuffocation, from the ſtrong metallic exhalations which are continually proceeding from the mines.

In Paraguay, the Jeſuits make a great revenue of the leaves of a plant, which moſt authors believe to be the evergreen caſſine, called yapon by the North Americans. Theſe leaves are imported into many countries by the name of Paraguay or South-ſea tea, and are drunk in infuſion, as the leaves of the China and Japan tea; and hence the evergreen caſſine is generally known with us, by the name of the South-ſea or Paraguay tea.

DUPLICATI. The name of a claſs in Linnæus's *Methodus Calycina*, conſiſting of plants which have a double *perianthium*. The claſs is exemplified in mallow, and moſt of the plants of that tribe or family; as lavatera, baſtard mallow, cotton, Syrian mallow, hollyhock, marſh-mallow, and Indian mallow (Urena). Theſe plants make part of the claſs *Monadelphia* in the Sexual Method, and of the Natural Order, *Columniferæ*, which ſee.

DUPLICATUS *flos*, (from *duplex*, double) having the corolla doubled, or, in other words, two ſeries or rows of petals. The term is expreſſive of the leaſt degree of plenitude or luxuriance of which the petals are ſuſceptible, and is exemplified in campanula with a nettle leaf, and thorn apple with a violet flower.

This ſimpleſt ſtage of luxuriance is very common in flowers with one petal.

DURATIO, Duration.

The diviſion of vegetables into trees, and perennial and annual herbs, is founded on the different duration of theſe plants-

plants. Trees fubfift for feveral years, both by the root and ftem: perennial herbs lofe their ftems during the winter, and are renewed by the root in the following fpring: annuals perform the changes of vegetation but once, and are perpetuated in the feed. Striking as thefe differences are, Linnæus thinks the duration of plants fo fallacious, that he never employs it as a fpecific difference. The reafon he affigns is very pertinent. The duration of plants, fays he, is frequently affected by place or climate, and therefore ought not to be regarded as an invariable circumftance proper for difcriminating the fpecies. In the warmer climates, which enjoy a perpetual fummer, moft of the plants are perennial, and of the tree kind; yet many of them, when removed to our colder European climates, lofe their woody texture, and become herbaceous and frequently annual. Of this the ricinus, or tree palma chrifti, and marvel of Peru, are familiar inftances.

Indian crefs, beet, fweet marjoram, and tree-mallow, which, with us, are annual, become, in very warm regions, perennial and fhrubby.

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EFFLORESCENTIA (from *effloreſco*, to bloom); a term expreffive of the precife time of the year and month in which every plant fhews its firft flowers.

Some plants flower twice a year, as is common between the tropics; others oftener, as the monthly rofe. The former are called by botanifts, *biferæ*; the latter, *multiferæ*. The etymology of each is evident.

The time of flowering is determined by the degree of heat which each fpecies requires; mezereon and fnow-drop produce their flowers in February; primrofe in the beginning of March; the greater number of plants during the month of May; corn, and other grain, in the beginning of June; the vine, in the middle of the fame month; feveral compound flowers, in the months of July and Auguft; laftly,

meadow-saffron flowers in the month of October, and announces the speedy approach of winter.

Grass of Parnassus always flowers about the time of cutting down the hay; and in Sweden, the different species of thistle, mountain-lettuce, succory, and balsam, seldom flower till after the summer solstice. The country-men even know, as by a calendar, that the solstice is past, when these plants begin to produce their flowers.

The temperature of the seasons has a mighty influence, both in accelerating and retarding the flowering of plants. All plants are earlier in warm countries: hence such as are cultivated out of their native soil never flower, till the heat of the climate or situation into which they are removed, is equal to that under the influence of which they produced flowers in their own country. For this reason, all exotics from warm climates are later in this country than many plants which it naturally produces.

In general, we may observe, that the plants of the coldest countries, and those produced on the mountains in all climates, being of equal temperature, flower about the same time: to wit, during our spring in Europe.

Plants that grow betwixt the tropics, and those of temperate climates, flower during our summer.

Plants of temperate climates situated under the same parallel of latitude with certain parts of Europe, but removed much farther to the West, such as Canada, Virginia, and the Mississippi, do not produce flowers till autumn.

Plants of temperate climates in the opposite hemisphere to Europe, flower during our winter, which is the summer of those regions.

Linnæus, and after him Adanson, have each given a sketch of a table of the different times in which the most common plants produce flowers at Upsal and Paris. Such tables, or flower-calendars, however, are very uncertain, and, to be useful, ought to be constructed after the most exact observations. The temperature of the season, as we mentioned above, sometimes retards, sometimes accelerates the flowering of plants; not to mention that annual plants flower

flower late or early, according to the time in which the feeds have been fown; and that perennials, for the firft year, are liable to the fame variations.

ENNEANDRIA, (from ἐννέα, nine, and ἀνὴρ, a man or hufband); the name of the ninth clafs in Linnæus's Sexual Syftem, confifting of plants which have hermaphrodite flowers with nine ftamina or male organs.

The orders, or fecondary divifions, in this clafs are three, being founded on the number of the ftyles, feed-buds, or female organs. Laurus, tinus, and caffytha, have one ftyle; rhubarb (*Rheum*,) has a triple ftigma or fummit, but fcarce any ftyle; flowering-rufh has fix ftyles.

The genera juft enumerated are all that belong to the clafs *Enneandria*. The firft genus, *laurus*, is very extenfive; comprehending the bay-tree, cinnamon-tree, camphire-tree, benjamin-tree, faffafras-tree, and the avocado or avogato pear.

ENSATÆ (from *enfis*, a fword); the name of the fixth order in Linnæus's Fragments of a Natural Method, confifting of plants with fword-fhaped leaves.

Lift of the Genera *contained in this Natural Order.*

Linnæan Genera.			*Englifh Names.*
Antholyza.			
Callifia.			
Commelina.			
Crocus,	—	—	Saffron.
Eriocaulon.			
Ferraria.			
Gladiolus,	—	—	Corn-flag.
Iris,	—	—	Iris, or Flower-de-luce.
Ixia.			
Moræa.			
Pontederia.			
Sifyrinchium.			

Linnæan Genera.	*English Names.*
Tradescantia, —	— Virginian Spider-wort, or Flower of a Day.
Wachendorfia.	
Xyris.	

Habit and Structure of the Plants of this Order.

This order, which is very nearly allied to the grasses and liliaceous plants, furnishes a very beautiful collection of perennial herbs, which are of different heights, from one inch to fifteen feet. A species of commelina is annual.

The Roots, are tuberous, or fleshy, and garnished with fibres; those of crocus, and two species of iris, called by Linnæus *Iris Xiphium* and *Sisyrinchium* from genera of Tournefort of the same name, are bulbous. The roots of the last species consist of two bulbs.

The Stems or stalks are simple, and commonly flat, or compressed on the sides. Crocus has no stem above ground; the flowers being produced immediately from the root.

The Leaves are simple, alternate, entire, sword-shaped, and, like the liliaceous plants, form at their origin a sheath or glove, which, in the greatest number, is cleft through the whole length, except at the base, where it is entire, and embraces the stem like a ring.

In Virginian spider-wort, wachendorfia, pontederia, and sisyrinchium, the sheath of the leaves is totally cleft. The leaves of tuberous iris and crocus are not sword-shaped, but formed like a prism with four prominent angles. Those of bulbous iris, Virginian spider-wort, and iris with a double bulb, are semi-cylindrical. The leaves of commelina are of an oval form.

The Flowers are hermaphrodite, and generally proceed from the summit of the stalks, either singly, as in iris; in an umbel, as crocus, Virginian spider-wort, and commelina; in a spike, as *Sisyrinchium*; in a *Corymbus*, as in *Ixia*; or in a panicle, that is, loose spike, as in wachendorfia. In *Pontederia*, they proceed from the angles of the leaves, ei-

ther fingly, or in an umbel. *Vide* UMBELLA, SPICA, CORYMBUS and PANICULA.

Moft of thefe plants want the *Perianthium*. The flowers burft from a common cover or fheath termed by Linnæus, SPATHA, which, in this order, is frequently permanent. Virginian fpider-wort and callifia, have a flower-cup of three leaves. *Eriocaulon* has a common calyx confifting of fcales laid over one another like tiles. The calyx in *Xyris* is hufky, like that of the graffes.

The PETALS are in number from one to fix; in eriocaulon, the calyx and petals are placed under the feed-bud. The feveral fpecies of commelina differ exceedingly in the number of their petals: fome have two green, and four coloured petals; fome four green, and but two coloured. In many fpecies of iris, the bafe of the outer petals, that are rolled back, is adorned with a fine foft downy beard, which, in fome other fpecies, is fupplied by three melliferous points fituated externally at the bafe of the flower.

Commelina has three crofs-fhaped bodies in the middle of the flower refembling the ftamina, but placed above them.

In *Wachendorfia*, the *nectarium* confifts of two hairs or briftly appearances, which are placed on the infide of the upper or higher petal.

The STAMINA are generally three in number. Virginian fpider-wort, and *pontederia*, have fix ftamina. The filaments in eriocaulon, fifyrinchium, and ferraria, are placed upon the ftyle and feed-bud; in Virginian fpider-wort, they are covered with a fine beautiful down.

The SEED-BUD is fometimes placed above the flower, as in eriocaulon, wachendorfia, callifia, and commelina; fometimes below it, as in iris, corn flag, ixia, and crocus.

The STYLE is generally fingle, and crowned with a triple ftigma. Eriocaulon has three flender ftyles.

The STIGMA in iris is very fingular, being large and expanded into three leafy parts, that in colour and figure refemble the petals, within which they are placed. This triple ftigma is broad, rolled backwards, and parted in two at the top of each leaf or divifion.

 In

In crocus, the ſtigma is ſawed on the edges, and twiſted into a ſpiral form.

The SEED-VESSEL is a dry capſule, generally of an oblong ſhape, and opens at three valves diſcovering the ſame number of cells, each incloſing a quantity of roundiſh ſeeds.

Theſe plants reſemble the liliaceous in their powers and ſenſible qualities; very few of them, however, are uſed in medicine.

The root of the white florentine iris, commonly called florentine orrice, is deſcribed by Lemery as pectoral. Outwardly it is uſed as ſweet powder for the hair. The dyers, perfumers, and confectioners, employ this root in their ſeveral profeſſions, to give a grateful ſcent to their cloaths, perfumes, comfits, and the like.

Of the common iris is made a green colour or pigment much uſed by the painters in miniature.

The roots of moſt of the ſpecies of ixia are eaten by the inhabitants at the Cape of Good Hope, who reckon them very delicate food.

The flower of the Virginian ſpider-wort is of very ſhort duration: hence the plant was named by Tournefort, *Ephemerum*, or the flower of a day.

Saffron is the chives or ſtamina of the *crocus ſativus*. In Hungary and Poland they eat it as a cordial, ſometimes an ounce or more at a time; but taken in great quantities with us, whether medicinally or for pleaſure, it produces convulſions, delirium, and even death.

EPIDERMIS. The ſcarf-ſkin, or outer covering of the bark of plants.

EPIPHYLLOSPERMÆ, (from ἐπι, upon, φυλλον, a leaf, and σπερμα, a ſeed.) The name of a claſs in Haller's Natural Method, conſiſting of plants which bear their ſeeds on the back of the leaf. This claſs comprehends all the ferns. *Vide* FILICES.

ERECTUS *flos*, an erect flower, in oppoſition to a nodding, or drooping one.

ERISTICI, (from ἐρις, ſtrife) polemical or controverſial

ſial botaniſts ſo termed by Linnæus; ſuch were Tournefort, Colet, and Chomel; Ray and Rivinus; Dillenius and Rivinus; Linnæus and Sigeſbeck.

ESSENTIALIS *character*. *Vide* CHARACTERES.

EUNUCHI, eunuchs. Full flowers ſo called, which, by multiplying the petals, exclude the ſtamina or male organs of generation altogether, and thus render the ſeed barren. *Vide* LUXURIANS and PLENUS *flos*.

F.

FACIES *Externa*, the port or habit of plants. *Vide* HABITUS and CHARACTERES.

FACTITIUS *Character*. *Vide* CHARACTERES.

FASCIATA *planta* (from *faſcis*, a bundle) plants ſo called, which conſiſt of ſeveral ſtems or ſtalks growing cloſe together ſo as to form a compact bundle.

FASCICULUS (a diminutive from *faſcis*, a bundle) a little bundle; a mode of flowering, in which the flower-ſtalks are erect, parallel, placed cloſe to one another, and raiſed to the ſame height; as in ſweet-william.

FAUX, the jaws or chaps. The gaping at the top of the tube of a monopetalous flower. *Vide* COROLLA.

FEMINEUS *flos*, a female flower. By this name Linnæus and the Sexualiſts denominate a flower which is furniſhed with the piſtillum or female organ of generation, but wants the ſtamina or male organ.

Female flowers may be produced apart from the male, either on the ſame root, or on diſtinct plants. Birch and mulberry are examples of the firſt caſe; willow and poplar of the ſecond. Male and female flowers ſeparated on the ſame plant, conſtitute the claſs *Monœcia* of Linnæus; ſeparated on diſtinct roots, the claſs *Diœcia*. *Vide* MONŒCIA & DIŒCIA.

FEMINA *planta*, a female plant, a plant which bears female flowers only; oppoſed to a male plant, which produces only male

male flowers, and to an adrogynous one, which bears flowers that are of both ſexes. *Vide ſupra.*

Female plants are produced from the ſame ſeed with the male, and arrange themſelves under the claſs Diœcia in the Sexual Method.

FIGURA, Figure; a property of natural bodies, from which marks and diſtinctive characters are frequently drawn. *Vide* CHARACTERES. Figure is more conſtant than number, more variable than proportion and ſituation.

The figure of the flower in the ſame ſpecies is more conſtant than that of the fruit: hence Linnæus adviſes to arrange under the ſame genus, ſuch plants as agree invariably in the flower, that is, in the calyx, petals and ſtamina, although the fruit or ſeed-veſſel ſhould be very different. The ſeed-veſſels of the different ſpecies of French honey-ſuckle, wild ſenna, acacia, Syrian mallow, and ſophora, are exceedingly diverſified in point of figure. Hence ſome former botaniſts, who paid more attention to the parts of the fruit, conſidered many of theſe ſpecies as diſtinct genera, and denominated them accordingly.

The figure of the ſeed-veſſel is a very common ſpecific difference in the Sexual Method.

FILAMENTUM, (from *filum*, a thread) the lower, ſlender, or thread-ſhaped part of the ſtamina, that ſerves as a foot-ſtalk for elevating the *anthers*, and connecting them with the vegetable. The term is equivalent to the *ſtamen* of Tournefort and other botaniſts. With Linnæus, *ſtamen* is a general term, the two parts of which are, the filament or thread, and the *anthera* or ſummit. *Vide* STAMEN & ANTHERA.

From the number of the filaments the firſt thirteen claſſes in the Sexual Method ariſe: it is, therefore, unneceſſary to enlarge upon that circumſtance in this place.

With reſpect to figure, filaments are either ſlender like a hair, as in plantain; flat, as in ſtar of Bethlehem; wedge-ſhaped, as in meadow-rue; twiſted like a ſcrew, as in hirtella; awl-ſhaped, as in tulip; notched, as in many of the

lip-

lip-flowers; or bent backwards, as in superb lily. The filaments in spider-wort and flower-of-a-day are beautifully covered with a fine hairy down.

With respect to proportion, the filaments are either very long, as in plantain; very short, as in arrow-headed grass; of equal lengths, as in most flowers; or irregular and unequal, as in the lip and cross-shaped flowers, which, from this circumstance, constitute the classes *Didynamia* and *Tetradynamia* in Linnæus's Method.

The situation of the filaments is generally opposite to the divisions of the calyx, and alternate with the petals. In elæagnus, and other flowers which want one of the covers, the filaments are placed alternate with the divisions of the remaining cover: whence I should be inclined to imagine that such flowers want the calyx, not the petals, as Linnæus asserts. In general it may be affirmed, that when the divisions of the calyx are equal in number to the petals and stamina, the petals are alternate with the stamina and flower-cup: the stamina are placed opposite to the divisions of the calyx, and to the valves or inclosures of the fruit, when these correspond in number, as sometimes happens in the natural order Caryophyllei; and all the parts in question are attached to the receptacle of the flowers. Again, if the stamina, in plants which have neither calyx nor petals, are equal in number, and opposite to the valves or inclosures of the fruit, we may reasonably conclude that they are placed upon the receptacle, as in the last case. But if, on the other hand, they are alternate with the valves, the inference is, that they are attached, like the plants of the class *Icosandria*, to the calyx.

In flowers that consist of one petal, the stamina are generally inserted into its base. For this observation, we are indebted to the minute and accurate researches of Vaillant and Pontedera, particularly the last, who is said to have dissected the flowers of two thousand species of plants, with a view to establish a general rule with respect to the insertion of the filaments of the stamina. By attending to the rule just mentioned, we can determine with exactness, in doubtful

fel cafes, whether the flower confifts of one or more petals. It is in this manner we pronounce with certainty the flowers of wood-forrel, and winter-green (trientalis) to confift of only one petal, although the divifions cohere fo flightly at the bafe as to be eafily miftaken for diftinct leaves.

There are, however, fome examples of flowers with one petal that have the ftamina attached to the receptacle; fuch are heath, American upright honey-fuckle, and fome other plants which belong to the natural order *Bicornes*. The fame may be faid of the ftamina of ciffus, aloe and acacia.

In flowers that confift of more petals than one, the ftamina are generally diftinct from the petals; being attached either to the calyx, as in the clafs *Icofandria* of Linnæus, and the natural orders *Calycanthemæ* and *Calyciflora*; or to the receptacle, as in the greater number. This rule, however, as well as the foregoing, admits of exceptions. In fea-pink, the filaments of the ftamina are inferted into the claws of the petals, which are five in number. The fame appearance is obferved in ftar-wort, which confifts of fix diftinct petals; and in moft of the plants of the natural order *Caryophyllei*, the ftamina are attached alternately to the claws of the petals and the receptacle.

A ftriking exception to the general rule has not yet been mentioned. In fome plants, as birth-wort and orchis, the ftamina are inferted, neither into the calyx, petals, nor receptacle, but into the pointal, or female organ of generation. Upon this fingular circumftance is founded the clafs *Gynandria* in the Sexual Method, which, however, contains many more genera than in ftrict propriety pertain to it; as paffion-flower, grevia, and fcrew-tree, which have no characteriftic mark of this kind.

In affimilating the animal and vegetable kingdoms, Linnæus diftinguifhes the filaments by the name of the fpermatic veffels.

FILICES, (from *filum*, a thread,) ferns, one of the feven families or natural tribes into which the whole vegetable kingdom is divided by Linnæus in his *Philofophia Botanica*. They are defined to be plants which bear their flower and fruit on

on the back of the leaf or ſtalk, which, in this claſs of imperfect plants, are the ſame. *Vide* FRONS.

In the Sexual Syſtem, the ferns conſtitute the firſt order or ſecondary diviſion of the twenty-fourth claſs, *Cryptogamia*; in Tournefort's Method they are the ſixteenth claſs; and in Ray's the fourth under the name of *Capillares*. Haller denominates them *Epiphylloſpermæ*, that is, plants that bear their ſeed on the back of the leaf; others term them *Acaules*, becauſe they have properly no ſtem.

FILICES is likewiſe the name of the fifty-fifth order in Linnæus's Fragments of a Natural Method, conſiſting of plants, which, among others, have the general character juſt mentioned.

Liſt of the Genera *contained in this Natural Order.*

SECTION I.

Ferns, in which the Parts of Fructification grow upon the Leaves.

Linnæan Genera.		English Names.
Acroſtichum.		
Adianthum,	— —	Maiden-hair.
Aſplenium,	— —	Spleen-wort, or milt-waſte.
Blechnum.		
Hemionitis,	— —	Mules-fern.
Iſoetes.		
Lonchitis,	— —	Rough ſpleen-wort.
Polypodium,	— —	Polypody.
Pteris,	— —	Brakes, or female fern.
Trichomanes.		

SECTION II.

Ferns, in which the Flowers are borne upon Foot-ſtalks that over-top the Leaves.

Marſilea,
Onoclea,

Ophiogloſſum,

Linnæan Genera.			*English Names.*
Ophioglossum,	—	—	Adder's-tongue.
Osmunda,	—	—	Osmund-royal, or flowering fern.
Pilularia,	—	—	Pepper-grass.

Habit and Structure of the Plants of this Natural Order.

These plants, in figure, approach the more perfect vegetables, being furnished, like them, with roots and leaves.

The ROOTS creep, and extend themselves horizontally under the earth, throwing out a number of very slender fibres on all sides.

The STEM in these plants is not to be distinguished from the common foot-stalk, or rather middle rib, of the leaves: so that, in strict propriety, the greater number of ferns may be said to be *acaules*, that is, to want the stem altogether: in plants of the second section, however, the middle rib, or a stalk proceeding from the root, overtops the leaves, and forms a stem, upon which the flowers are supported.

The LEAVES proceed either singly, or in greater numbers, from the extremities of the branches of the main root. They are winged, or hand-shaped, in all the genera, except in adder's-tongue, pepper-grass, and some species of spleenwort.

The FLOWERS of the ferns, whatever be their nature, are, in the greater number of genera, fastened, and, as it were, glued to the back of the leaves; in some, they are supported upon a stem or stalk, which rises above the leaves, and is either, as we said above, a prolongation of their middle rib, or issues out of the centre of the plant, unconnected with the leaves altogether. From these different modes of flowering, arise the two sections, or divisions of this Natural Order.

The STAMINA are placed apart from the seed-bud, or female organ, in a genus termed by Adanson, *palma-filix*: in the other ferns, where we have been able to discover the stamina, they are found within the same covers with the seed-

feed-bud. This principal part of the flower, however, has not been accurately or satisfactorily traced, except in a very few genera, the chief of which are *isoetes*, pepper-grass, and *marsilea*. M. de Jussieu, who first discovered the flowers of the two last genera, observes, in his Memoir on this subject, delivered to the Royal Academy of Sciences, in 1739, that their stamina are *anthers*, or tops without filaments; that they are top-shaped, and open above by a transverse or broad furrow. They have only a single cavity, from which issues a fine dust, composed of simple, hard globules, which do not open when put into water, as those of perfect plants.

M. Maratti, in 1760, employed his enquiries upon the stamina of these imperfect plants, and is said to have traced them in a great many genera. His discoveries, however, on this subject, have not been generally received as authentic.

With respect to what are vulgarly called the seeds of ferns, we have not yet been able to determine, with any degree of precision, whether they are indeed seeds, or of the nature of stamina. M. de Jussieu inclines to the latter opinion.

The Canadian fern bears at the origin of each division of the leaves a number of berries, which being sown, produce new plants in the same manner as other seeds. In the Pyrenæan Mountains is produced a small species of annual fern, which sows itself every year, and is termed by Tournefort, *filicula montana folio vario*. M. de Jussieu is of opinion, that a strict attention to this plant might alone accurately decide the question, which has been so long agitated among botanists; not whether the ferns are furnished with seeds, (for that few people are now disposed to call in question); but of what nature these seeds are, and where placed; whether the stamina are separate from the female parts, on the same, or on different roots; or, whether these parts are mingled together under the same cover, or in the same heap or bundle of flowers, as some observations of Dillenius would lead us to imagine.

In short, all our researches upon this subject are mere conjecture; and men knew much more of these imperfect plants,

plants, who never ſuſpected they were furniſhed with ſtamina or ſeeds, than the moderns, who confining their enquiries to thoſe minute parts which generally elude the ſight, have entirely neglected their port or habit; although that only can furniſh accurate diſtinctive characters in this natural tribe or family of plants.

Moſt of the ferns have a heavy, diſagreeable ſmell; they are opening, and attenuating.

The true maiden-hair, or Capillaire of Montpelier, a well-known medicine, is the *adiantum foliis coriandri* of Caſpar Bauhin, the *capillus veneris verus* of Gerard, the *adiantum capillus veneris* of Linnæus. It is a plant which grows in France, Italy, and the Levant, upon old moiſt walls, in wells, fountains, and the clefts of rocks. The leaves, which are almoſt triangular, have a fragrant ſmell, and an agreeable taſte, though ſlightly aſtringent and bitter. They are much uſed in the countries which produce the plant in ſyrups, and in opening and diuretic decoctions.

Black maiden-hair, or oak fern, the *adiantum pulcherrimum* of Bauhin, the *Aſplenium adiantum nigrum* of Linnæus, is produced naturally in moſt parts of England upon old walls, and in ſhady places, at the roots of trees and ſhrubs. The pedicles are black, and the pollen or duſt upon the back of the leaves is of the colour of ſaffron.

As there has been no ſmall confuſion in diſtinguiſhing the ſeveral ſpecies of maiden-hair uſed in medicine; and as ſome, ignorant in botany, have erroneouſly ſubſtituted in their place, the leaves of Polypody and Hart's tongue, which they do not, however, much reſemble, and even the root of the former; I thought it would not be improper in this place to obſerve, that the genuine ſpecies of Capillaire are reduced to ſix: that of Montpelier, or *adiantum Capillus Veneris*; the black which has juſt been deſcribed; the *Trichomanes*, or Engliſh black, generally uſed with us for the firſt ſort; the true white, or *ruta muraria*; Ceterach of the ſhops, and *adiantum pedatum*, which grows naturally in Canada and Virginia. All the ſorts, except the firſt and laſt, rank under the genus *Aſplenium*.

The

The Canada maiden-hair approaches neareſt in quality to that of Montpelier. The traders, we are told, pack up their goods with it inſtead of hay, when they are ſent into diſtant countries, as France and England; a circumſtance which renders this fern ſo very common in Europe.

Ceterach, or common ſpleen-wort, juſt mentioned, which, like other ſpecies of the ſame genus, grows naturally on old walls, churches, and clefts of moiſt rocks, is termed by the natives of Languedoc, where it is produced in great abundance, golden locks, becauſe of its great reſemblance to hair, and its golden colour. It is pectoral, aperient, and particularly adapted for diſeaſes of the ſpleen.

The plants of the polypody kind ſtrike their roots into whatever they can lay hold of, whether ſtone, earth or tree. They were formerly believed to be particularly attached to oak-trees; but this is a miſtake, as they are found much more frequently on other trees. Polypody is preſcribed in medicine, and eſteemed a gentle purgative.

Ophiogloſſum has only one leaf, from the middle of which proceed one or two ſpikes of flowers reſembling a ſerpent's tongue; from which fancied ſimilitude this genus of plants has derived its name in both languages. The plant is vulnerary, particularly the leaves, when infuſed in oil of olives.

The root of the female fern, a ſpecies of pteris, has a bitter aſtringent taſte, and enters into the compoſition of fern-ſtone, a very powerful aſtringent. In England, the aſhes of fern kneaded in water, have been ſucceſsfully uſed in bleaching linen, and ſupplying the place of ſoap. The trivial name *aquilina*, which Linnæus gives to this ſpecies of *filix*, is derived from the figure of a tranſverſe ſection of the root, which is ſaid to reſemble the Roman eagle.

Royal oſmund, a ſpecies of flowering fern, is leſs bitter and aſtringent than the other ferns; the pith of the root is white, vulnerary, and uſed in decoction, as are likewiſe the bunches or cluſters of flowers.

FLORESCENTIA (from *floreſco*, to flouriſh or bloom). The act of flowering, which Linnæus and the Sexualiſts compare

compare to the act of generation in animals; as the ripening of the fruit, in their judgment, resembles the birth. *Vide* FLOS.

FLORIBUNDI (from *florere*, to bloom.) The name of the seventh class in Linnæus's Method founded on the calyx, consisting of plants that have a simple perianthium, into which are inserted the petals and stamina. This class comprehends the *icosandria* of the Sexual Method, and the two natural orders, *Calycanthemæ* and *Calyciflora*, which see.

FLORISTÆ, from *Flora*. By this name Linnæus terms a class of botanical writers, who enumerate the indigenous or native vegetables of any particular place or country. The most eminent of these enumerations, or, as they are commonly called, Floras, are Ray's and Hudson's *flora anglica*; Linnæus's *flora suecica* and *lapponica*; Haller's, *helvetica*; Magnolius's, *monspeliaca*; Gmelin's, *sibirica*; Vaillant's, *parisina*; Ruppius's, *jenensis*; and Hill's *flora britannica*.

These floras are arranged according to some approved system, as Hudson's after that of Linnæus, and contain the generic and specific differences of whatever method they adopt. They are useful in conducting to the knowledge of the curious plants in one's country; as they instruct both in the place of growth, the nature of the soil, the time of flowering, and the duration of any particular plant in question.

FLOS. The flower: by this term, former botanists, as Columna, Jungius, Ray, and Tournefort, evidently meant the petals, or beautiful coloured leaves of the plant, which generally adhere to the seed-bud, or rudiment of the fruit. *Vide* ANTHUS.

Since the introduction of the Sexual Method, the petals have lost their importance, and are now only considered as a finer sort of cover, which is generally present, but not essentially necessary to the existence of a flower.

A flower then, in modern botany, is as different in meaning from the same term in former writers, as from the vulgar acceptations of the word at this day. The petals, the calyx, nay,

nay, the threads or filaments of the ſtamina may all be wanting; yet it is a flower ſtill, provided the anthers or male organ, and the ſtigma or ſummit of the ſtyle, the female organ, can be traced, and that either immediately in the neighbourhood of one another, as in moſt plants; on different parts of the ſame plant, as in the claſs *Monœcia*; or on different plants, raiſed from the ſame ſeed, as in the claſs *Diœcia*. In this manner is to be underſtood the general principle with which the Sexual Method ſets out, that every vegetable is furniſhed with flower and fruit. The eſſence of the flower, as the author immediately ſubjoins, conſiſts in the *anthers* and *ſtigma*, which conſtitute a flower, whether the covers, that is, the calyx and petals, are preſent or not. *Vide* Principles of the Sexual Method, under the article ANTHERA.

The general principle juſt mentioned is extended by Linnæus to thoſe plants vulgarly called imperfect; I mean the ferns, moſſes, muſhrooms, lichens and ſea weed; in moſt of which we have not been able to diſcover any thing reſembling flower or fruit. As, however, in a few genera, ſomething like ſtamina and ſeeds, have been diſcovered; it is probable that they are all furniſhed with ſimilar parts, although their minuteneſs, or their ſituation within the plant, may prevent us from diſcovering them, either by the naked eye, or with the aſſiſtance of glaſſes.

The flowers of pepper-graſs and marſilea, two of the fern tribe, were diſcovered by B. Juſſieu, in 1739; thoſe of iſoetes by Linnæus; the ſtamina of the fuci, a numerous tribe of ſea-weed, were diſcovered by Reaumur, in 1711; whoſe obſervations on this curious ſubject were confirmed by Griſelini, in 1750. Micheli, in 1729, diſcovered, as he imagined, the ſtamina of the muſhrooms. The calyx, petals, ſtamina and pointal are properly parts of the flower; the remaining parts of the fructification pertaining only to the fruit.

FLOSCULOSI. The name of the twelfth claſs in Tournefort's Method, conſiſting of compound flowers which are compoſed entirely of florets with hollow funnel-ſhaped

petals.

petals. The term is exemplified in burdock, thiſtle, artichoke, blue-bottle, and cudweed. To this claſs Tournefort has added ſcabious, teaſel, and ſome others, which reſemble the compound flowers in being contained within a common calyx.

Moſt of the plants in this claſs belong to the two firſt orders in the claſs *Syngeneſia* of the Sexual Method. *Vide* SYNGENESIA.

FLOSCULUS. A partial or leſſer floret of an aggregate flower. *Vide* AGGREGATUS *flos*.

FOLIATIO, (from *folium*, a leaf.) The curious manner in which the leaves are wrapped or folded up in the buds. This term in the latter editions of Linnæus's works is changed for VERNATIO, which ſee.

FOLIOLA. The leſſer leaves or lobes, which, together, conſtitute a compound leaf. *Vide infra.*

FOLIUM. A leaf, defined to be a part of a plant extended into length and breadth in ſuch a manner, as to have one ſide diſtinguiſhable from the other. This is Miller's definition; and is certainly more intelligible than that of Linnæus, which denominates leaves the organs of motion, or muſcles of the plant.

The leaves are not merely ornamental to plants; they ſerve very uſeful purpoſes, and make part of the organs of vegetation.

The greater number of plants, particularly trees, are furniſhed with leaves: in muſhrooms, and ſhrubby horſe-tail, they are totally wanting. Ludwig defines leaves to be fibrous and cellular proceſſes of the plant, which are of various figures, but generally extended into a plain, membranaceous or ſkinny ſubſtance. They are of a deeper green than the foot-ſtalks on which they ſtand, and are formed by the expanſion of the veſſels of the ſtalk, among which, in ſeveral leaves, the proper veſſels are diſtinguiſhed by the particular taſte, colour, and ſmell of the liquors contained within them.

By the expanſion of the veſſels of the ſtalk are produced ſeveral ramifications, which croſſing each other mutually,

form a kind of net, the meſhes or interſtices of which are filled up with a tender cellular ſubſtance, called the pulp, pith, or parenchyma. This pulpy ſubſtance is frequently conſumed by certain ſmall inſects, whilſt the membranous net remaining untouched exhibits the genuine ſkeleton of the leaf.

The net in queſtion is covered externally with an epidermis or ſcarf-ſkin, which appears to be a continuation of the ſcarf-ſkin of the ſtalk, and, perhaps, of that of the ſtem. M. Deſauſſure, a judicious naturaliſt, has attempted to prove that this ſcarf-ſkin, like that of the petals, is a true bark, compoſed itſelf of an epidermis and cortical net; theſe parts ſeem to be the organs of perſpiration, which ſerve to diſſipate the ſuperfluous juices.

The cortical net is furniſhed, principally on the lower ſurface of the leaf, with a great number of ſuckers or abſorbent veſſels, deſtined to imbibe the humidity of the air. The upper ſurface, turned towards heaven, ſerves as a defence to the lower, which looks downward; and this diſpoſition is ſo eſſential to the vegetable œconomy, that, if a branch is overturned in ſuch a manner as to deſtroy the natural direction of the leaves, they will, of themſelves, in a very ſhort time, reſume their former poſition; and that as often as the branch is thus overturned.

Leaves then are uſeful and neceſſary organs; trees periſh, when totally diveſted of them. In general, plants ſtript of any of their leaves, cannot ſhoot vigorouſly; witneſs thoſe which have undergone the depredations of inſects; witneſs, likewiſe, the very common practice of ſtripping off ſome of the leaves from plants, when we would ſuſpend their growth, or diminiſh the number of their ſhoots. This method is ſometimes obſerved with corn and the eſculent graſſes; and, in cold years, is practiſed on fruit-trees and vines, to render the fruit riper and better coloured: but in this caſe it is proper to wait till the fruits have acquired their full bulk, as the leaves contribute greatly to their growth, but hinder, when too numerous, that exquiſite rectifying of the juices,

juices, which is ſo neceſſary to render them delicious and palatable.

When vegetation ceaſes, the organs of perſpiration and inſpiration become ſuperfluous. Plants, therefore, are not always adorned with leaves: they produce new ones every year; and every year the greater part are totally diveſted of them, and remain naked during the winter. *Vide* FRONDESCENTIA *et* DEFOLIATIO.

Having premiſed theſe general obſervations reſpecting the anatomy and uſe of the leaves, I proceed to conſider the external form and configuration of this uſeful and ornamental part of the plant, and to particularize the ſeveral diſtinctions which are made by botanical writers on that ſubject.

Of leaves, ſome are primary, others acceſſary; theſe laſt are the *ſtipulæ* and *bracteæ* of Linnæus; the firſt of which are a ſet of ſcales, generally placed at the origin of the young footſtalks for ſupport: the latter accompany the flowers, and differ in figure and colour from the proper leaves of the plant. *Vide* BRACTEA and STIPULA.

In viewing the external appearance of leaves with reference to vegetable arrangement, two things occur to be conſidered:

The FORM of leaves, and their DETERMINATION.

By the *form of leaves*, I underſtand their ſtructure, and external configuration. By their *determination*, every thing reſpecting leaves, which does not pertain to their form, but to their diſpoſition on the plant.

Leaves, conſidered with reſpect to their form, are divided into ſimple and compound.

Simple Leaves.

Simple leaves are ſuch whoſe footſtalk is terminated by a ſingle expanſion; in other words, whoſe diviſions, however deep, do not reach the middle rib. To underſtand this, let it be obſerved, that the middle rib of every leaf is the principal

cipal prolongation of the footſtalk, which, to form the membranaceous expanſion called the leaf, runs out, as was obſerved above, into a number of ramifications, that inoſculating and croſſing each other mutually, form the cortical net already deſcribed. When theſe ramifications of the footſtalk are ſo connected as to form one entire expanſion, the leaf is ſaid to be ſimple; but when the middle rib becomes, in fact, a footſtalk, and many different expanſions, inſtead of one, proceed from the common footſtalk, the leaf is ſaid to be compound. This will be further illuſtrated below.

Simple leaves are either

Round, *folium orbiculatum*; as in *rumex digynus*.

Egg-ſhaped, *ovatum*; as in *vaccinium myrtillus*.

Oval or elliptic, *ovale*; as in the roſe.

Wedge-ſhaped, *cuneiforme*; as in *apium graveolens*.

Oblong, *oblongum*, as in ſorrel and woolly ceraſtium.

Lancet-ſhaped, *lanceolatum*; that is, tapering towards each extremity, as in *plantago lanceolata*.

Equally broad every way, *lineare*; as in roſemary, pine, and the graſſes.

Chaffy and ever-green, *aceroſum*; as in fir, yew, pine, and cedar-trees.

Awl ſhaped, *ſubulatum*; that is, gradually contracting towards the top, as in juniper, *arenaria ſaxatilis*, and *ſedum rupeſtre*.

Ear ſhaped, *auriculatum*; that is, furniſhed with two appendages or ears at the baſe near the foot-ſtalk, as in *jungermannia ciliaris*.

Heart-ſhaped, *cordatum*; as in lime-tree.

Kidney-ſhaped, *reniforme*; as in aſarabacca, ſea bind-weed, *campanula rotundifolia*, and *ſaxifraga granulata*.

Arrow-ſhaped, *ſagittatum*; as in field bind-weed, and common heath.

Halbert or ſpear-ſhaped, *haſtatum*; as in bitter-ſweet; and *ſcutellaria haſtifolia*.

Parted half-way down, *fiſſum*.

Divided almoſt to the midrib, *lobatum*.

From

From the number of divifions in either cafe, the leaves are termed *bifida*, *trifida*, *biloba*, *triloba*, &c.

Hand-fhaped, *palmatum*; that is, refembling an open palm or hand, a fan, or an umbrella. Thefe leaves have very deep longitudinal divifions extending almoft to the bafe; fuch are thofe of *palma chrifti*, *palmetto* or thatch, fome of the ferns, and the true rhubarb, the *rheum palmatum* of Linnæus. The leaves of a fpecies of paffion-flower are fhaped like the wings of a bat.

With refpect to their tip or extremity, fimple leaves are,

Stumped, or feem bitten, *truncatum*; as in the tulip-tree.

Terminated with tendrils, *cirrofum*; as in fuperb lily.

The margin or brim of the leaf runs out into rigid points or thorns (*folium fpinofum*) as in holly; or is furnifhed with horizontal points of the confiftence of the leaf (*folium dentatum*) as in dandelion, fpring-primrofe, and *epilobium montanum*. In *vaccinium myrtillus*, and *arbutus alpina*, it is fawed (*folium ferratum*); that is, furnifhed with teeth, whofe points look towards the tip or upper extremity of the leaf. In *primula farinofa*, it is notched (*crenatum*) or cut into fmall teeth, which are either fharp or round at the points, and do not look to either extremity. In *erica ciliaris*, it is fringed like an eye-lafh, (*ciliatum*), or guarded longitudinally by parallel briftles. The upper part of the leaf has commonly a fmoother furface than the lower; it is befides of a deeper green, and has its nerves and ramifications generally hollow; whilft the ribs of the lower furface are moft commonly prominent. This rule, however, is not univerfal; fome leaves have their ribs prominent above, and hollow below. Thefe leaves are called by botanifts, *folia bullata*; that is, bliftered leaves. Such are thofe of many fpecies of fage. Again, the leaves of fucculent, bulbous, and feveral liliaceous plants, have on neither fide, the prominent nerves or ribs which are found on almoft all the leaves of trees.

With refpect to their furface, leaves are,

Cottony, or covered with a beautiful white down, *folium tomentofum*; as in *ceraftium tomentofum*, rafpberry, and the greater part of plants that grow in the neighbourhood of the fea.

Woolly,

Woolly, or ſoft like velvet, *lanatum*, as in iron-wort, *ledum villoſum*, and ſome geraniums.

Hairy, *piloſum*; as in *cortuſa* and *juncus piloſus*.

Briſtly, *hiſpidum*; as in *turritis hirſuta*.

Rough with knots, *ſcabrum*; and covered with pimples, *papuloſum*; as in ſeveral of the fig-marigolds.

Prickly, *aculeatum*; as in ſome of the thiſtles.

Covered with tranſparent points, *punctatum*; as in St. John's wort.

Smooth, *glabrum*; as in bay.

Shining or glittering, *nitidum*; as in Canadian angelica, and ſome magnolias.

Wrinkled, *rugoſum*; as in ſage.

Beautifully plaited, *plicatum*; as in lady's mantle.

Riſing and falling in convexities towards the margin, *undulatum*; as in *œnothera molliſſima*.

Covered with ſimple, unbranched prolongations of the footſtalk, that extend from the baſe to the tip, *nervoſum*; as in cinnamon, camphire, and ſome of the plantains.

Covered with veins, or branched veſſels, *venoſum*; as in *laurus nobilis*, and moſt plants.

Clammy, *viſcidum*; as in *ſenecio viſcoſus*.

Beautifully coloured, *coloratum*; as in *amaranthus tricolor*.

Naked, *nudum*; that is, without any kind of hair or pubeſcence.

Ray, and after him Linnæus, has diſtinguiſhed a natural family of plants, by the name of *aſperifoliæ*; that is, plants whoſe leaves are rough to the touch.

With reſpect to their ſubſtance, or general port, leaves are,

Cylindrical, *teres*; as in *allium vineale*, and *oleraceum*.

Succulent, as in the aloes.

Sword-ſhaped, as in *iris*.

Shaped like a Perſian ſcymitar, *acinaciforme*; as in ſome of the fig-marigolds, ſome of which are likewiſe hatchet and tongue-ſhaped.

Two-edged, *anceps*; as in *ſiſyrinchium*.

Keel-ſhaped on the under ſurface, *carinatum*; as in *crinum aſiaticum*.

Compound Leaves.

Compound leaves are ſuch whoſe footſtalk is terminated by ſeveral expanſions; in other words, whoſe diviſions extend to the common footſtalk, which not running into the membranaceous part of the leaf, ſupports the ſeveral lobes or leſſer leaves, called *foliola*, of which the compound leaf conſiſts.

Theſe *foliola* or lobes are, themſelves, ſmall ſimple leaves, and, like them, vary in their form, according to the diſtinctions already eſtabliſhed. Like them, alſo, they are ſometimes furniſhed with ſhort footſtalks, (*folium petiolatum*); ſometimes ſeated upon the middle rib without any proper footſtalk, (*folium ſeſſile.*) *Vide infra.*

In compound leaves, the production of the baſe of the leaf to which the leſſer leaves adhere is by botaniſts called *coſta*, the rib. The ſame term is uſed for the principal prolongation of the footſtalk in ſimple leaves. This prolongation in each of the lobes of a compound leaf is by ſome denominated a nerve; by others, leſs properly, a vein. The nerve is either moſt conſpicuous in the middle of the leaf, and then it is likewiſe ſometimes called *coſta*, the rib; or it is divided at its entrance into the membranaceous part of the leaf, into two, three, five, ſeven, or more parts.

As ſtudents of botany are frequently at a loſs to know compound leaves by ſight, and ſometimes apt to miſtake a common footſtalk for a branch, it is proper to obſerve, that in the angle which they form in iſſuing from the ſtems and branches, the footſtalks of the leaves are flat, if not hollowed; ſo that they preſent two ſurfaces, a front and a back; the former, as we have ſaid, hollow or flat, the latter, convex: whereas, ſtems and branches are univerſally alike on both ſides, being either both round, both flat, or both angular.

Again, buds are never obſerved in the angles formed by the lobes of a compound leaf with the foot-ſtalk: they iſſue from the angle which the whole leaf makes with the branch or ſtem. Laſtly, the branches in woody plants continue after the

the leaves are fallen. The common footſtalk of a compound leaf, however much it may reſemble a branch in appearance, may always be certainly diſtinguiſhed by this circumſtance, that it falls off with the leaves which it ſupports.

Compound leaves are divided into compound properly ſo called; leaves twice compounded; and leaves more than twice compounded. Each diviſion admits of a variety of modifications, which give riſe to as great a variety of terms.

A compound leaf properly ſo called, *folium compoſitum*, is only once compounded, and admits of the following varieties.

A finger-ſhaped leaf, *digitatum*, is properly a modification of a hand-ſhaped one, with this difference, that the diviſions, which reſemble fingers, are diſtinct, and extend to the extremity or top of the footſtalk on which they are collected in rays. Lupin, horſe-cheſnut, Ethiopian ſourgourd, and ſilk cotton-tree, furniſh examples. From the number of fingers or leaves thus collected, other terms have been invented. When two, the leaf is termed *binatum*; when three, *ternatum*, from the numerals, two and three, compounded with the Latin verb, ſignifying to grow. Sometimes too, the fingers in queſtion are ſeated immediately on the top of the footſtalk; ſometimes, as in trefoil, each finger is furniſhed with a ſmall proper footſtalk.

A winged or pinnated leaf, *pinnatum*, is compoſed of a number of ſmaller leaves arranged like wings along the ſides of a common footſtalk. In the former ſpecies of compound leaves, the lobes are attached to the ſummit of the footſtalk; in this, the common footſtalk is prolonged, becomes a kind of middle rib, and receives the lobes on both ſides of it. Theſe lobes or leſſer leaves are diſtinct, and have generally ſmall partial footſtalks, by which they are attached to the common footſtalk or middle rib. The term is commonly appropriated to leguminous plants, as the *acacias* and moſt of the butterfly-ſhaped flowers, and admits of conſiderable varieties.

The lobes of a winged leaf are ſometimes oppoſite, as in ſumach; ſometimes alternate, as in Greek valerian. Compound

pound winged leaves are frequently terminated by an odd leaf or lobe, which is not attached to the ſides, as the other lobes, but ſtands by itſelf, and proceeds from the extremity of the middle rib. This mode of winged leaf is exemplified in many of the ſumachs, acacias, and ladies finger. Inſtead of the odd lobe juſt mentioned, ſome winged leaves are terminated with tendrils. When neither an odd lobe, nor a tendril terminates a winged leaf, it is called by botaniſts an abruptly winged leaf, as in *robinia caragana*. In ſome plants the lobes are of an unequal length, ſome pairs being larger than others. The leaf in that caſe is ſaid to be interruptedly winged, and is exemplified in ſome ſpecies of ladies finger. Laſtly, a winged leaf ſometimes conſiſts of two lobes or leſſer leaves only, as in fabago or bean caper, and ſome of the acacias. This ſpecies of winged leaf is termed by botaniſts *folium conjugatum*.

A recompounded or twice compounded leaf, *folium decompoſitum*, is that in which the footſtalk, inſtead of ſupporting lobes or leſſer leaves on the top, or on each ſide, bears partial footſtalks, from which proceed the leaves on both ſides.

In barren-wort each of the lateral footſtalks ſupports three leaves; this ſort of leaf is termed by Linnæus, *biternatum*, or *duplicato-ternatum*; that is, double-three-leaved. In many acacias, the ſmall leaves are arranged like wings, not around the common footſtalk, but on each ſide of the partial or lateral footſtalks proceeding from it; ſo that this kind of compound leaf is very properly ſtiled double-winged, (*bipinnatum ſeu duplicato-pinnatum*).

In ſome ſpecies of paſſion-flower, and cuckow-pint, the footſtalk divides at top into two parts, on the inſide of which the lobes or leſſer leaves are ſupported. This ſpecies of compound leaf is termed foot-ſhaped (*pedatum*).

A more than twice compounded leaf, *folium ſupradecompoſitum*, is that in which the lateral footſtalks, inſtead of bearing leaves, as in the former caſe, are ſubdivided into other partial footſtalks, from whence proceed the lobes or leſſer leaves; in other words, double-three-leaved, and double-winged-leaves, are here inſerted into a common foot-ſtalk: the leaf, in the firſt caſe, being termed triple-three-leaved (*triternatum*

ſeu

ſeu triplicato-ternatum); in the ſecond, triple-winged (*tri-pinnatum ſeu triplicato-pinnatum.*

Of the Determination or Diſpoſition of Leaves.

The determination of leaves, whether ſimple or compound, comprehends the four following particulars: the place of the leaf; its inſertion; ſituation; and direction.

By the place of the leaf is meant the particular part where it is attached to the plant.

A flower-leaf, *folium florale*, is placed near the flower, and never appears but with it.

A branch-leaf, *folium rameum*, is ſeated or placed upon the branch.

A ſtem-leaf, *folium caulinum*, grows from the ſtem or ſtalk of the plant.

An axillary-leaf, *folium axillare*, is that which proceeds from the inſertion of the branches: in other words, from their arm-pit, or the angle which they form with the ſtem.

A bottom, radical, or root-leaf, *folium radicale*, comes immediately from the root, without adhering to the ſtem.

A ſeed-leaf, *folium ſeminale*, proceeds immediately from a ſeed which has ſprouted; and is a production of its *cotyledons* or *lobes*. *Vide* COTYLEDONES.

By the inſertion of a leaf is meant the manner in which it is attached to the plant.

A leaf furniſhed with a foot-ſtalk, is termed by Botaniſts *petiolatum folium*; that which is ſeated immediately on the ſtem or branch without any manifeſt foot-ſtalk, *folium ſeſſile*, and is exemplified in ſpiked mint, *teucrium ſcordium*, and *tormentilla erecta*.

The ſame name is retained, when the baſe of the leaf only is left without any membranaceous expanſion, as in jujube.

A target ſhaped leaf, *folium peltatum*, has the footſtalk inſerted into the center of the lower diſk or ſurface, and not into the baſe or margin. This ſingular kind of leaf is exemplified in water lily, *palma Chriſti*, Indian-creſs, jack in a box, and a ſpecies of *geranium*, hence named *peltatum*.

This

This ſpecies of leaf was formerly termed *umbilicated*, from a ſmall cavity like a navel, that is formed on the upper ſide, immediately oppoſite to the inſertion of the footſtalk.

A running-leaf, *decurrens*, adheres cloſely to the ſtalk as if glued to it, from the baſe to the middle, the upper half remaining detached and free; in other words, this ſort of leaf extends itſelf downwards along the ſtem, beyond its proper termination. It is exemplified in thiſtle, *verbaſcum*, and globe flower.

A leaf is ſaid to embrace the ſtem, *amplexicaule*, when by its baſe it entirely ſurrounds it tranſverſely; as in moth-mullein, and black henbane. Theſe leaves are generally heart and arrow-ſhaped.

A perforated leaf, *folium perfoliatum*, differs from the former term, in that the perforating ſtalk or branch does not touch the margin, but approaches the center of the leaf. It is exemplified in perforated *uvularia*, and round-leaved *bupleurum*.

Two oppoſite leaves cohering at their baſe, ſo as to form one body embracing the ſtalk, are termed by Linnæus *folia connata*. Many ſpecies of honey-ſuckle and hemp-agrimony furniſh proper examples.

A glove-like leaf, *folium vaginans*, has the baſe formed into a tube or cylinder, which embraces the ſtalk like a ſheath or glove; as in corn, graſs, and many liliaceous plants.

Situation regards the reſpective poſition of the leaves between themſelves. In this reſpect leaves are

Alternate, when they come out ſingly, and are ranged gradually upon both ſides of the ſtem, as in *antirrhinum cymbalaria*; oppoſite, when they come out in pairs, facing each other; the reverſe of the former.

In moſt plants with oppoſite leaves, each pair is croſſed by that immediately above or below it, ſo that the leaves point four different ways; thus, if one pair ſtands eaſt and weſt, the one immediately below it ſtands north and ſouth, and croſſes the former at right angles; the third pair croſſes the ſecond,

fecond, and fo on alternately, till all the pairs are completed. In this way are arranged the leaves of myrtle, jeffamine, rocket, and feveral others.

Placed in whorls or rings, *verticillata folia*, when more than two leaves furround the ftem. The different modifications of this term are derived from the number of leaves of which the ring confifts; *folia terna*, when three, as in oleander; *quaterna*, four, as in *fedum verticillatum*; *quina*, five; *fena*, fix, as in *galium fpurium*.

Starry leaves, *ftellata*, a modification of the former term: when four, fix or more leaves are fo placed around the ftem as to refemble a ftar, as in wood-roof and *galium*.

Scattered, *fparfa*, when they are difpofed without any regular order; as in feveral fpecies of lily.

Crowded, or difpofed in clufters, *conferta*, when they come out from the fides of the branches in great numbers, and are placed fo clofely together, that it is not eafy to difcover their exact fituation, as in toad-flax, and *antirrhinum monfpeffulanum*.

Laid over one another like tiles or fifh-fcales, *imbricata*, as in fome fpecies of faxifrage.

Placed in bundles, *fafciculata*, when many leaves proceed from the fame point, as in the larch tree, and fome pines.

Ranged along two fides of the branches only, *difticha*, as in the fir-tree.

With refpect to direction, leaves are,

Oblique, *obliqua*, when the bafe looks to the fky, and the tip to the horizon, as in knee-holly, Perfian fritillaria and protea.

Bent inwards, *inflexa*, when they are bowed or turned upwards towards the plant.

Laid clofe to the ftem, *adpreffa*.

Upright, *erecta*, nearly perpendicular; in other words, when they form an extremely fmall angle with the ftem.

Spreading, *patentia*, when they recede from the ftem, yet fo as to form an acute angle with it.

Horizontal,

Horizontal, *horizontalia*, or *patentiſſima*, when they ſtand at right angles with the ſtem.

Reclined, *reclinata et reflexa*, when they are bowed downwards in ſuch a manner that the baſe is higher than the tip or ſummit.

Rolled back, *revoluta*, when the ſummit or tip is rolled inwards.

Depending, *dependentia*, when they point with their ſummits to the earth.

A rooting leaf, *folium radicans* is one, which being planted, ſtrikes root, and vegetates. Such are the fleſhy ſolid leaves of ſeveral liliaceous plants, as the aloe and ſea-onion.

A floating leaf, *natans*, lies or floats on the ſurface of the water, as in the water-lily and pond-weed.

A drowned or ſunk leaf, *demerſum*, is that which is placed below the ſurface of the water, as in the ſea-weed.

In moſt ſpecies of *ruſcus*, or butcher's broom, the flowers grow upon different parts of the leaves; on the middle of the upper ſurface in *ruſcus aculeatus et flexuoſus*; on the middle of the under ſide in *ruſcus hypophyllum et hypogloſſum*; in which laſt the flowers iſſue from between the main leaf, and a ſmaller one reſembling a tongue, which is placed near the middle of the under ſurface of the former. In *ruſcus androgynus*, the flowers proceed from the margin or brim of the leaves.

The leaves furniſh very elegant and natural marks in diſcriminating the ſpecies of plants. In no part, indeed, is nature more various than in the ſtructure of the leaves, the very numerous ſpecies of which ought, therefore, to be carefully ſtudied by the beginning botaniſt. Ray, Linnæus, Royen, and other eminent botaniſts, have borrowed the greater part of their ſpecific names, as well as characters, from this part of the plant.

The oppoſition and alternation of the leaves furniſh characters which are generally conſtant, that is, found to obtain in all the plants of the ſame genus, or even of the ſame natural order.

In euphorbia, rock-rofe, American viburnum, calves fnout, lily and French willow-herb, thefe characters ferve to diftinguifh the fpecies; in fome of which the leaves are oppofite, or placed two by two; in others alternate.

In the different fpecies of jeffamine, fpeedwell and borage, the lower leaves at the branches are oppofite; the upper leaves at the flowers, alternate.

Pond-weed, and a fpecies of cinquefoil, have the lower leaves alternate; the upper ones at the branches, oppofite.

In oleander, the lower leaves are oppofite; the upper ones grow by threes, the loweft modification of leaves placed in a whorl or ring (*folia verticillata*). *Vide Supra.*

In butcher's broom, the lower leaves grow by threes; the upper ones are alternate: the branches have the fame fituation.

In a fpecies of calve's fnout, and tick feeded fun-flower, *coreopfis*, the lower leaves grow by fours; the upper ones are alternate.

The natural fituation of the leaves in plants that are much branched, Linnæus thinks is beft concluded from the radical or bottom leaves.

Oppofite and compound leaves are often fubject to luxuriance in the fame fpecies, and hence give rife to confiderable varieties, which muft, in all cafes, be carefully diftinguifhed from the fpecies.

In fome fpecies of *lyfimachia* and pimpernel, the leaves, which are generally oppofite, grow occafionally by threes, fours, or fives.

A fpecies of purple loofe-ftrife has fometimes three leaves growing round the ftalk.

As thefe, however, are but accidental varieties, and the characters in queftion are not permanent, but fubject to vary when the plant is propagated from feed, we fhould be careful, in all fuch inftances, not to load or incumber any genus of plants with an unneceffary multiplication of fpecies, when the characters are not fufficiently conftant to entitle any particular plant to that appellation.

When thefe varieties happen in plants with oppofite leaves, the

the ſtalk, from being ſquare, becomes furniſhed with many ſides, as of ſix in the laſt inſtance.

Again, finger-ſhaped leaves, of which there are many different modes, occaſionally gain an addition of one or two leaves in the ſame ſpecies, as in ſome trefoils.

Curled leaves, *folia criſpa*, which are a frequent variety, Linnæus denominates a ſort of monſtrous production, and compares them to the prodigious multiplication of the petals in full flowers. Without doubt, no genuine ſpecies of plants has curled leaves, the appearance being accidental and inconſtant: yet botaniſts, till the time of Linnæus, not attending to this circumſtance, have conſidered as diſtinct ſpecies, many plants in which the ſuppoſed character of the ſpecies is but occaſionally preſent. To ſay truth, Linnæus's greateſt merit conſiſts in the excellent rules he has laid down for eſtabliſhing the ſpecies and varieties, particularly the latter, which he found involved in one undiſtinguiſhed chaos, but has now happily reduced into the moſt perfect ſymmetry and order.

The curled leaves, juſt mentioned, are to be found in ſome ſpecies of mallow, dock, nipplewort, hart's-tongue, endive, and baſtard rocket.

In tanſy, feverfew, baſil, and mint, when the leaves are curled, their ſcent is conſiderably heightened.

We explained above the nature of a bladdery or bliſtered leaf, by botaniſts termed *folium bullatum*. The warted leaf, *folium verrucoſum*, is a ſpecies of the former; and, both ſeem to be incidental varieties, produced from the luxuriance of a wrinkled leaf, *folium rugoſum*, as curled leaves are a preternatural extenſion of an undulating or waved one.

Inſtances of bladdery and warted leaves may be ſeen in ſome ſpecies of baſil, braſſica and lettuce.

In a ſpecies of ſoapwort, termed by Miller *ſaponaria hybrida*, and by Linnæus *ſaponaria concava anglicana*, the leaves are generally hollowed like a ſpoon, or ladle. *Vide* CARYOPHYLLEI *in fine*.

In ſome ſpecies of cow-parſnep, water hore-hound, braſſica, elder, and valerian, the leaves are incidentally found

to vary from broad-leaved to narrow-leaved; but this variety is leſs frequent.

Such are the principal varieties to which leaves are incident in their form and ſtructure. I conclude this article, with obſerving, that in the enumeration of terms expreſſive of the form and configuration of the leaves, I have purpoſely avoided mentioning ſuch whoſe meaning is ſufficiently obvious, without any laboured elucidation. The reader will obſerve too, that I ſeldom offer an explanation, without accompanying it with as familiar an example as the nature of the thing will admit. Without an illuſtration of this kind, every ſuch explanation muſt be inadequate and unſatisfactory; and yet, Linnæus has in very few inſtances favoured us with any: nor have his latinized tranſlators, Lee and Berkenhout, diſcovered any vehement inclination to remove the thick cloud, which ſtill reſts on every part of this delightful ſcience.—In aſſimilating the vegetable and animal kingdoms, Linnæus denominates leaves, the lungs of plants.

FOLICULUS, (diminutive from *follis*, a leather bag); a ſpecies of ſeed-veſſel, generally conſiſting of one valve, ſynonymous to *conceptaculum*, and ſubſtituted for it in the later editions of Linnæus's works. *Vide* CONCEPTACULUM.

FOLLICULI are likewiſe defined by the ſame author to be ſmall glandular veſſels diſtended with air, which appear on the ſurface of ſome plants; as at the root of water-milfoil, and on the leaves of aldrovanda. In the former, the veſſels in queſtion are roundiſh, and furniſhed with an appearance like two horns; in the latter, pot-ſhaped and ſemi-circular.

FRAGMENTA *Methodi Naturalis*, the Fragments of a Natural Method; Linnæus's title of a plan or ſketch of a natural arrangement of plants, which he has barely traced in the *Philoſophia Botanica* and *Genera Plantarum*. The Author of the preſent work has the honour of having been the firſt who attempted to complete the draught of which only the outline had been furniſhed by the great Maſter; his Deſcriptions of the habit and ſtructure, virtues, ſenſible qualities and œconomical uſes of the plants which compoſe the ſeveral Natural Orders of Linnæus having been ſubmitted by

 him

him to the public in the firft edition of the Botanical Dictionary, publifhed in 1770, in precifely the fame form in which they now appear. Linnæus's own Lectures on the fubject, from the notes of Gifeke and Fabricius, two of his pupils, were not given to the world till a long time after *.

FREQUENS *Planta*, a plant fo termed by Linnæus, which grows fpontaneoufly and copioufly in a proper foil. The term is fynonymous to *vulgaris planta* of the fame author.

FRIGIDÆ *Plantæ*, from *frigus*, cold; plants that are natives of cold climates. Such are thofe of the Alps, Siberia, Canada, Germany, Holland, England, and France to the northward of Paris.

Thefe plants, fays Linnæus, fcarce bear a degree of heat that is as 30 on a fcale in which 0 is the freezing point, and 100 the heat of boiling water. In exceffive heats, they firft prove luxuriant, then turn feeble and die.

FRONDESCENTIA, (from *frons*, the leaf of a tree,) a term expreffive of the precife time of the year and month in which each fpecies of plants unfolds its firft leaves.

All plants produce new leaves every year; but all do not renew them at the fame time. Among woody plants, the elder, and moft of the honey-fuckles; among perennial herbs, crocus and tulip, are the firft that pufh or expand their leaves. The time of fowing the feed decides with refpect to annuals. The oak and afh are conftantly the lateft in pufhing their leaves: the greateft number unfold them in fpring; the moffes and firs in winter. Thefe ftriking differences, with refpect to fo capital a circumftance in plants as that of unfolding their leaves, feem to indicate that each fpecies of plant has a temperature proper or peculiar to itfelf, and requires a certain degree of heat to extricate the leaves from their buds, and produce the appearance in queftion.

This temperature, however, is not fo conftant as, to a fuperficial obferver, it may appear to be. Among plants of the fame fpecies, there are fome more early than others; whether that circumftance depends, as it moft commonly

* In 1792.—See more upon this fubject in the Preface.

does,

does, on the nature of the plants, or is owing to differences in heat, expofure, and foil. In general, it may be affirmed, that fmall and young trees are always earlier than larger or old ones.

The pufhing of the leaves is likewife accelerated or retarded according to the temperature of the feafon; that is, according as the fun is fooner or later in difpenfing that certain degree of heat which is fuitable to each fpecies.

Till very lately the time in which plants renew or unfold their leaves, was confidered as an abfolute fixed term or limit, happening every year, nearly at the fame time, in every climate. Linnæus is the only one who has paid proper attention to this curious fubject. His defign in publifhing the obfervations which he had made in eighteen provinces of Sweden, fituated betwixt the fixtieth and feventieth degrees of north latitude, during the three fucceffive years, 1750, 1751 and 1752, was merely to difcover what trees begin to open their buds and unfold their leaves, at the moft proper time for fowing of barley.

The birch-tree appeared to him the moft proper indication for this purpofe; and he concludes, that in every province in Europe, there may be found trees, in default of the birch, that will, in the like manner, indicate the proper time for fowing grain and efculent herbs. Thefe obfervations, however, do not perfectly anfwer the purpofe for which they were made, as the birch, and every other fimilar tree, can only indicate the paft or prefent, not the future; which, by the way, is the only thing importing the hufbandman to know, that he may have time to prepare the ground and fow the feed; befides, the fpecies birch, like moft other trees, has individuals, which are three or four weeks later than the reft; fo that if we have not an opportunity of feeing more than one tree, we cannot poffibly divine whether it is the lateft or earlieft of its fpecies, and thus may often run the rifk of delaying to fow the feed a whole month beyond its proper time.

In fhort, to be able to draw any certain conclufions, with refpect to the time in which the different plants of different

climates unfold their leaves, and to reduce their apparent variations to fixed and precife rules, we muft

I. Obferve the different times in which different individuals of the fame fpecies unfold their leaves; and thence draw the mean times betwixt the earlieft and lateft.

II. Obferve, by a thermometer, the difference of temperature in the early and late years.

III. Draw mean refults of the degrees of heat obferved every month and every day, for a fufficient number of years.

IV. Obferve the days in which the frofts begin to ceafe, and thofe in which there are ten degrees of heat, even during the night. Thefe are the times in which vegetation, formerly clogged, if not altogether ftopt, begins to make progrefs, and to continue without interruption.

Laftly, From the extreme products of each of thefe obfervations, we muft drawn mean refults; as without fuch precaution, nothing certain can be obtained in enquiries of this kind.

For the application of thefe obfervations, the reader is referred to the ingenious M. Adanfon's Familles des Plantes, a book which for variety of botanical knowledge, exceeds any hitherto publifhed.

FRONDOSUS *flos*. *Vide* PROLIFER *flos*.

FRONS, is defined by Linnæus to be the trunk of the palms and ferns, in which the leaves are confounded with the ftem and branches, and frequently with the flower and fruit. The term, indeed, feems to import the union of a leaf and a branch; and that the pretended trunk in queftion is really a compound leaf, appears from this circumftance, that it has plainly two fides, which are different in figure and colour; whereas all the parts of a real trunk or ftem are perfectly fimilar.

The leaves of the ferns and palms are generally winged. The bafe of the foot-ftalk, or that part which has no *pinnæ* or leffer leaves proceeding from it, conftitutes, according to Linnæus, another trunk, which he denominates *ftipes*.

FRUCTESCENTIA, (from *fructus*, fruit,) comprehends the

the precife time in which, after the fall of the flowers, the fruits arrive at maturity, and difperfe their feeds.

In general, plants which flower in fpring, ripen their fruits in fummer, as rye; thofe which flower in fummer, have their fruits ripe in autumn, as the vine; the fruit of autumnal flowers ripens in winter, or the following fpring, if kept in a ftove, or otherwife defended from exceffive frofts. Thefe frofts, fays M. Adanfon, are frequently fo pernicious and violent as to deftroy the greateft part of the perennial plants of Virginia and Miffiffippi that are cultivated in France, even before they have exhibited their fruit. The plants which flower during our winter, fuch as thofe of the Cape of Good Hope, ripen their fruit in fpring in our ftoves.

The time in which plants ripen their fruit, combined with that in which they germinate and unfold their leaves, gives the entire fpace or duration of their life, which, in the fame fpecies, is proportionably fhort or long, according to the greater or lefs intenfity of heat of the climate, in which they are cultivated.

In general, it appears, that if the heat is equal and uninterrupted, the time betwixt the germinating or fprouting and flowering of annual plants, is equal to the interval betwixt their flowering and the maturation of their fruits, or even the total deftruction of the whole plant.

In Senegal and the other burning climates, an annual plant generally lives as long before as after flowering.

In temperate climates, as France and England, plants which rife in fpring and flower before the month of June, live a little longer before than after flowering; fuch as flower in fummer, as barley and oat, which flower in June, live as long before as after; while the later plants, which do not rife till autumn, live longer after flowering than before.

Thefe facts, which are undoubted, prove the very great efficacy of heat in operating the vegetation of plants. In effect, it is in fummer, when the heat is moft equal, that the life of plants is equally divided into two parts; whereas in fpring and autumn, when the heat is more unequal, it is cut

or divided unequally: the plants of the ſpring ſeaſon, which is colder in the beginning, live, as we have ſaid, longer before flowering than after, when the heat is more intenſe: and, on the contrary, the plants of autumn, which is warmer in its beginning, live a ſhorter time before than after flowering, when the heat becomes every day leſs, and conſequently retards the maturation of the fruit.

Theſe obſervations are only to be underſtood of herbaceous vegetables, and thoſe chiefly annual. Among trees, ſome do not renew their leaves till a little before, and ſometimes not till after, they have produced flowers; ſo that there is a much greater interval between their flowering and the maturation of their fruit, than between the former and the unfolding of their leaves, which, in trees, may be conſidered as equivalent to the germination or ſprouting of the ſeed in annuals. The maturation of the fruit in trees is never accompliſhed, while they abound in ſap, and produce new wood; for this reaſon, when we would accelerate the bearing of fruit-trees, we generally ſtrip off a part of their leaves, which diminiſhes the motion of the ſap, and thus removes the obſtruction which retarded the ripening of the fruit. *Vide* FOLIUM.

FRUCTIFICATIO, (from *fructus*, fruit, and *facio*, to make.) Under this name Linnæus comprehends the flower and the fruit, which, according to the Sexualiſts, are connected in the ſame manner as generation and birth in animals. In fact, although the fruit does not ſwell and ripen till after the flower is fallen, yet it ſeems now to be generally allowed, that its firſt beginning or rudiment is in the flower.

Fructification is defined to be a temporary part of plants appropriated to generation, terminating the old vegetable and beginning the new. The parts of fructification are, by Linnæus, reckoned ſeven: viz.

The calyx, empalement, or flower-cup.
The corolla, or petals.
The ſtamina, threads, chives, or male organs.
The piſtillum, pointal, or female organ.
The pericarpium, or ſeed-veſſel.
The ſeeds.

The receptacle or bafe, upon which all the other parts are feated.

The four firft are properly parts of the flower; the three laft, of the fruit. The germen or feed-bud connects them together. This is properly part of the flower, as being the bafe of the piftillum; yet as, in procefs of time, it becomes the feed-veffel, it is generally confidered as a part of the fruit: and hence, if the perianthium or flower-cup furrounds it alone, it is called a perianthium of the fruit.

The effence of every vegetable, fays Linnæus, confifts in the fructification: the effence of the fructification confifts in the flower and fruit.

The various aphorifms eftablifhed by modern botanifts with refpect to the importance of the parts of fructification in vegetable arrangement, are delivered in feveral parts of this work; particularly under the articles CLASSIS, GENUS and CHARACTERES. The following fall properly enough to be eftablifhed in this place.

I. The primary difpofition or arrangement of vegetables ought, with due reftrictions, to be derived from the parts of fructification. Former botanifts urged the infufficiency of thefe parts to ferve as a foundation for the claffes and genera; becaufe, perhaps, they were not all fo accurately known as at prefent: and, even with all our fuperior knowledge, we are often at a lofs in afcertaining feveral genera of plants, without calling in the affiftance of parts unconnected with the fructification.

By a rigid attention to the aphorifm juft mentioned, Linnæus has converted into fpecies many genera of Tournefort, Dillenius, Boerhaave, Ruppius, Vaillant, Micheli, and Gmelin, which are not founded upon the parts of fructification alone.

The following genera of Tournefort, among many others, furnifh examples.

Purple bird's-neft is, by Linnæus, converted into a fpecies of orchis.

Biftort, of knot-grafs.

Turnip, of cabbage.

 Skirrets,

Skirrets, of water-parſnep.
Hermodactylus, of Iris.
Orpine, of leſſer houſe-leek or ſedum.
Flea-wort, of plantain.
Cork-tree, of the oak.
Larch-tree, of the pine.
Dwarf broom, of ſingle-ſeeded broom or geniſta.
Dragons, of cuckow-pint.
Engliſh black maiden-hair, of ſpleen-wort.
The bean, of the vetch.
Water-melon, of the gourd.

II. Vegetables which agree in all the parts of fructification are not to be arranged in different claſſes, orders, or genera.

Geſner was the firſt who ſuggeſted this aphoriſm; Cæſalpinus the firſt who reduced it into practice.

III. The more conſtant any part of fructification is, throughout a great number of ſpecies, the more certainly is it to be depended on as a characteriſtical mark in diſtinguiſhing the genera.

The nectarium of the genus *hypecoum* is conſtant, but not the jointed pod.

The ſpotted berry of the genus *convallaria* is found in all the ſpecies; the corolla in lily of the valley, Solomon's ſeal and one blade, three ſpecies of convallaria, is very different.

The corolla of wild ſena is conſtant, but not the pod.

In the genus *lobelia*, which includes ſeveral genera of other authors, the corolla is conſtant. The ſeed-veſſel, in cardinal-flower, rapuntium of Tournefort and Dillenius, laurentia of Micheli, and lobelia of Plumier, which are all ſpecies of the Linnæan genus, is different. That particularly of the laſt ſpecies, the lobelia of Plumier, is pulpy, and of the cherry kind, containing a nut or ſtone with two cells; whereas in the other ſpecies, it is a dry membranaceous capſule.

In vervain, the calyx and corolla are conſtant throughout the ſpecies: the ſtamina and ſeeds are different.

FRUCTIFLORÆ, (from *fructus*, fruit, and *flos*, a flower);

flower); the name of the tenth clafs in Royen's Natural Method, confifting of plants, in which the flower, or, to fpeak more properly, the receptacle of the flower is placed above the fruit: it correfponds to the clafs *coronatrices* in Linnæus's *Methodus Calycina*, and is exemplified in French willow-herb.

FRUCTISTÆ, (from *fructus*, fruit;) a clafs of Syftematic Botanifts fo termed by Linnæus, who have arranged vegetables from the feed-veffel, feeds and common receptacle, the three parts of the fruit. The beft fyftems of this kind are thofe of Cæfalpinus, Morifon, Ray, Chriftopher Knaut, Hermannus, and Boerhaave. *Vide* METHODUS.

FRUCTUS, the fruit; defined by Jungius and former botanifts to be an annual part of the plant, which adheres to the flower and fucceeds it; and, after attaining maturity, detaches itfelf from the parent plant; and, being commodioufly lodged in the bofom of the earth, gives birth to a new vegetable. This definition is fufficiently accurate, and fo perfpicuous, that it requires no illuftration. I fhall only obferve, that, in its vulgar acceptation, the word fruit is expreffive, not of the feeds, which are doubtlefs the effence of every fruit, but of the cafe or veffel in which they are contained. Thus, when we fpeak of the fruit of an apple-tree, we always mean the lufcious pulp which enfolds the feeds; although that, in ftrict propriety, is only the cover of the fruit.

The Sexual Syftem being founded on the fuppofed impregnation of the feeds by the male duft, the importance of that part of the plant, (the feed) is confiderably augmented: accordingly Linnæus, among the other principles with which his Method fets out, eftablifhes the aphorifm manifeftly deducible from Jungius's definition, that a fruit is conftituted by the prefence of the feed, whether there be a feed-veffel or not; and to this he immediately fubjoins, that all vegetables are furnifhed with fruit, that is, feeds; though thefe are frequently fo minute, or fo fituated, as to elude the fight. *Vide* FLOS.

With refpect to the imperfect plants here manifeftly alluded to,

to, the ſeeds of the *fuci* were diſcovered in 1711, by M. de Reaumur; thoſe of the moſſes by Dillenius, in 1719 and 1741. Linnæus, in his Philoſophia Botanica, arrogates the diſcovery of the latter tribe of plants to himſelf. "Semina muſcorum," ſays he, "ego detexi." Micheli was the firſt who in 1729, detected the ſeeds of muſhrooms; his curious diſcoveries in this, till of late, ſhamefully neglected tribe of vegetables, were confirmed by the obſervations of Mr. Gleditſch, in 1753; and of M. Battarra, in 1757.

The ſeeds of ſome ferns were diſcovered by Dr. Bobart of Oxford; thoſe of others, by Bernard de Juſſieu, in 1739; and of M. Maratti in 1760.

FRUCTUS *carnoſus*, fleſhy or pulpy fruit. The name given by ſome former botaniſts to that ſpecies of ſucculent ſeed-veſſel called by Linnæus, *Pomum*. *Vide* POMUM.

FRUMENTA, corn; the name of the twenty-firſt claſs in Ray's *Methodus Propria*, conſiſting of the eſculent grains; as oat, rye, barley, and the like.

FRUTEX, a ſhrub; a plant which riſes with a woody durable ſtem to a height ſuperior to that of under-ſhrubs, inferior to that of trees. Trees too always riſe with a ſingle body or trunk. Many ſhrubs have ſeveral ſtems growing out of the ſame root.

For the opinions of different authors concerning the foundation of the diſtinction of vegetables into herbs, trees, ſhrubs, and under-ſhrubs, ſee the article ARBOR.

FRUTICES. The name of the ſecond claſs in Moriſon's Syſtem, and of a diſtinction in all the ſyſtematic botaniſts prior to Linnæus, conſiſting of thoſe woody plants termed ſhrubs. *Vide ſupra*.

FUCATÆ *figuræ*; figures of plants coloured from nature; ſuch are thoſe of Martin, Blackwell, and Weinmannius.

FULCRA, props, ſupports. By this name Linnæus diſtinguiſhes certain minute external parts, which ſerve either to ſupport or defend the plants on which they are found, from external injuries; or to facilitate ſome neceſſary ſecretion.

Theſe

Thefe *fulcra* have undergone confiderable alterations fince their firft publication in the Fundamenta Botanica in 1736, when they ftood thus: bractea, cirrus, fpina, aculeus, ftipula, glandula. In a fubfequent edition of the fame book, printed at Paris in 1744, they are augmented to nine, by the addition of fcapus, petiolus and pedunculus, which were formerly confidered as different fpecies of trunks. In the Philofophia Botanica, publifhed in 1755, the three terms which were formerly added are again transferred to the head of trunks, and another term is joined to the original lift, fo that it ftands thus; ftipula, bractea, fpina, aculeus, cirrus, glandula, pilus. Laftly, in the Termini Botanici, publifhed in the Amœnitates Academicæ by Elmgren, a pupil of Linnæus; and in the Delineatio Plantæ, prefixed to the fecond volume of the Syftema Naturæ, the *fulcra* undergo another revolution. Inftead of *aculeus* and *fpina* the different offenfive weapons of plants, is fubftituted the general term *arma*: and inftead of *pilus*, a particular fpecies of defenfive weapon, is fubftituted *pubes*, which implies every kind of pubefcence or hairy appearance on the furface of plants. *Glandula*, which had appeared in the very earlieft editions of Linnæus's works, is not now to be found in the lift of *fulcra*, being included in the general term *pubes*; and the partial trunks, as they were formerly reckoned, *petiolus* and *pedunculus*, once more change their place, and are transferred to an article with which they have no connection. The lift of *Fulcra*, thus new-manufactured, ftands as follows:

Petiolus, the foot-ftalk of the leaf.

Pedunculus, the foot-ftalk of the flower.

Stipula, a fcale feated at the infertion of the foot-ftalks.

Bractea, a coloured leaf accompanying the flower.

Cirrus, a tendril or clafper.

Arma, the offenfive weapons of plants.

Pubes, the hairs, defenfive weapons, or fecretory veffels of plants.

A particular defcription of each of thefe auxiliary parts is given under its refpective term.

FUNDA-

FUNDAMENTALES *figuræ*, figures of plants not ſhaded, outlines; ſuch are thoſe of Brunsfelſius, Fuchſius, Cluſius, and Father Plumier.

FUNGI, muſhrooms. The name of one of the ſeven families or tribes into which all vegetables are divided by Linnæus in his Philoſophia Botanica. In the Sexual Syſtem, they conſtitute the fourth order of the claſs *Cryptogamia*; in Tournefort's Method, a part of the ſeventeenth claſs, entitled *aſpermæ vulgo habitæ*.

In Ray's and Haller's Methods is likewiſe a claſs of the ſame name, containing the ſame plants. Theſe have all a very ſimilar appearance; and as the parts of fructification, which by modern botaniſts are ſolely attended to in diſtinguiſhing the genera, are ſcarcely to be diſcovered, the conſequence has been, that, till lately, ſcarce any diſtinction of the genera has been attempted, and of courſe, this very conſiderable part of the vegetable kingdom, to the great reproach of ſcience, lay much uncultivated. I muſt not, however, forget, upon this occaſion, to do that juſtice which is ſo eminently due to the ingenious reſearches of Dillenius and Micheli, to whom we were long indebted for moſt of the little knowledge we poſſeſſed of the *Fungi*, as well as ſome other tribes of imperfect plants.

The former, in his Catalogus Plantarum circa Giſſam, publiſhed at Francfort in 1719, arranges muſhrooms from the figure of their footſtalk, their hat or upper part termed pileus, its laminæ or plates, holes and cavities, into ten genera, which contain in all about two hundred ſpecies.

Micheli, in a work entitled Nova Plantarum Genera, publiſhed at Florence in 1729, arranges this tribe of plants from the figure of their flowers, and the ſituation of the ſtamina and ſeeds, which, as he imagined, he had detected in the greateſt number.

Micheli's method is divided into four ſections, which contain in all about eight hundred ſpecies, arranged under thirty genera, accurately and perſpicuouſly diſtinguiſhed. This author is the firſt who, by means of the microſcope, diſcovered ſomething like ſtamina in the muſhrooms: and

attempted to prove that thefe plants, like the more perfect ones, are produced from feed.

Gleditfch's Arrangement of the mufhrooms, publifhed at Berlin, in 1753, differs but little from that of Micheli juft mentioned. This author defcribes with accuracy about a thoufand fpecies or varieties of thefe plants, and gives figures of each of his genera, copied from thofe of Micheli.

Battarra, in his Enumeration of the mufhrooms that grow in the neighbourhood of Rimini, printed in 1755, has given figures and defcriptions of two hundred and fixty fpecies, which are diftributed, not very methodically indeed, among eighteen fections or orders, which might, without hurting the work, have been reduced to feven.

The author proves in this work, that mufhrooms owe their exiftence, not to putrefaction, as had been erroneoufly imagined, but to feeds; that thofe which grow upon vegetables have their fibres contiguous only to thefe plants, not continuous with them; and in fact, have their own proper roots, as other vegetables. He has likewife evinced, that they are not a lufus naturæ, but that their fpecies are conftant, and renewed by uniform laws, as many fpecies, which grow in Italy, grow likewife in Britain, France, Germany and Turky; and as he, Micheli, and Gleditfch had fucceeded in their experiments for raifing mufhrooms fimilar to thofe which they had fown.

After all, our knowledge of this part of vegetable nature is exceedingly limited; and, as I have often had occafion to obferve in the courfe of this work, a very intimate acquaintance with thefe and plants of a fimilar character, is fcarcely to be expected during the dominion of the Sexual Syftem: for, as the parts of fructification in thefe plants, if they are indeed fuch, can only be detected by the aid of glaffes, it is impoffible they fhould be fo univerfally known, as to give much affiftance in detecting the genus, far lefs be of themfelves fufficient towards that detection.

Fungi, the name of the fifty-eighth order in Linnæus's Fragments of a Natural Method, confifting of the following

genera,

genera, which are the fame with thofe of the fourth order of the clafs Cryptogamia in his Artificial Method, with the addition of byffus, which is there joined to the algæ or fea-weed.

Lift of the Genera *contained in this Natural Order.*

Linnæan Genera.		English Names.
Agaricus,	— —	Agaric.
Boletus.		
Byffus.		
Clathrus.		
Clavaria,	--- —	Club-top.
Elvela feu Helvella,	—	Turban-top.
Hydnum.		
Lycoperdon,	— —	Puff-ball.
Mucor,	— —	Mould.
Peziza,	— —	Cup-mufhroom.
Phallus,	— —	Stinkhorns, Morell.

Thefe plants are rarely branched, fometimes creep, but are moft commonly erect. Such as are furnifhed with branches have them of a light fpungy fubftance like cork. Mufhrooms differ from the fuci in that thofe, which, like the fuci, have their feeds contained in capfules, are not branched, as that numerous clafs of fea-weed is.

The greateft part of mufhrooms have no root; fome, in their ftead, have a number of fibres, which, by their inofculations, frequently form a net with unequal mefhes, fome of which produce plants fimilar to their parent vegetable.

The STAMINA, in thefe plants, are ftill undetermined. What Micheli takes for this pretended male organ has all the appearance of a number of fhoots or fuckers, under the form of a fine powder or duft.

The SEEDS are either fpread over the furface of the plant, or placed in cavities which are open, and refemble the open

open capſules of ſome of the fuci. In muſhrooms which are branched, the ſeeds are frequently viſible by the naked eye, and always to be diſtinctly obſerved with the aſſiſtance of a good microſcope.

Theſe plants are very aſtringent, and of familiar uſe for ſtopping violent hæmorrhages.

As a vegetable food, they are, at beſt, ſuſpicious. Several *Fungi* are rank poiſon.

Agaric is an excreſcence found upon the trunks and large branches of ſeveral trees, but chiefly upon the larch, and ſome oaks. It is of two ſorts, the male and female; the former is yellow, hard and woody, and uſed for dying black; the latter is covered with a yellow bark, and white within: it taſtes ſweet at firſt, but becomes bitter after being held a ſhort time in the mouth. This is the ſort uſed in medicine. It is adminiſtered in infuſion, from two drams to half an ounce, and in ſubſtance from one to two drams. Being a very ſtrong purgative, it ought to be corrected with ginger, cloves, cinnamon, mace, mint, or ſome fixed ſalt. The troches prepared of agaric and ginger are commonly preſcribed in inveterate diſorders and obſtructions of the bowels from half a dram to one dram. From agaric is likewiſe drawn an extract and a roſin. It enters into ſeveral purgative compoſitions, particularly the confection of hamech, hiera picra, the bleſſed extract, and pills of euphorbium.

Jew's ears, the peziza auriculam referens of Ray and Caſpar Bauhin, is a fungous excreſcence reſembling an ear, found on the ſtumps of elder-trees, before their leaves appear. It is in great eſteem among the common people as a remedy for ſore throats, but is ſeldom found in the ſhops.

The powder, which is found in the cavity of ſome ſpecies of lycoperdon after burſting, is a very powerful aſtringent: and, mixed with the white of an egg, is effectual in ſtopping all ſorts of hæmorrhages.

FURCÆ, Forks: a ſpecies of armature or offenſive weapon, with which ſome plants are furniſhed. They are of the nature of prickles, being, like them, detached from the

the bark or outer rind only, and confiſt of two or three prongs. The term is exemplified in berberry, currant-tree, triple-thorned acacia, hard ſeeded chryſanthemum, black horehound, barleria, *fagonia*, and garden burnet.

G.

GALEA *Corollæ ringentis*, the helmet or upper lip of a grinning or gaping flower. The term was invented by Rivinus, and ſtands oppoſed to *barba-ringentis*, the beard or lower lip.

GEMMA, a bud, a compendium of a plant ſeated upon the ſtem and branches, and covered with ſcales, in order to defend the tender rudiments incloſed from cold and other external injuries, till their parts being unfolded, they acquire ſtrength, and render any further protection unneceſſary.

Buds, together with bulbs, which are a ſpecies of buds generally ſeated upon or near the root, conſtitute that part of the herb by Linnæus called *Hybernacula*; that is, the winter quarters of the future vegetable—a very proper appellation, as it is during that ſevere ſeaſon that the tender rudiments are protected in the manner juſt mentioned. *Vide* BULBUS.

Plants, conſidered in analogy to animals, may properly enough be reckoned both viviparous and oviparous. Seeds are the vegetable eggs; buds, living fœtuſes, or infant plants, which renew the ſpecies as certainly as the ſeed.

Mr. Ray was the firſt who gave the name of *gemma* to the bud, which had formerly been denominated *germen*. *Gemma*, indeed, was uſed to ſignify one kind of bud, that containing the flower, which we now denominate *oculus*, an eye; but was by the ancients carefully diſtinguiſhed from the *germen*, or bud containing the leaves and wood, hence termed by the French, *bouton à bois*.

Pliny marks this diſtinction in the following words. "Germen autem eſt id quod ex ipſis ſurculis arborum primo

primo vere exit, ex quo deinde folium producitur: nam gemma proprie est floris, quanquam utrumque confundatur." Notwithstanding this obvious remark of Pliny, the modern botanists, after the example of Ray, have applied the term *gemma* to every kind of bud, whether of the flowers or leaves; the other term *germen* being appropriated to the seed-bud, or that part of the flower which swells and becomes the seed-vessel vulgarly termed the fruit.

With respect to its external form or figure, a bud is a small rounded body, sometimes ending in a point. In the different species, however, of the same genus, the form of the buds is so different, as frequently to afford an excellent mark of distinction during the winter. This is particularly exemplified in many species of willow and buckthorn, especially the former.

Buds are placed at the extremity of the young shoots, and along the branches, being fixed by a short foot-stalk upon a kind of brackets, the remainder of the leaves in the wings or angles of which the buds in question were formed the preceding year. They are sometimes placed single; sometimes two by two, and those either opposite or alternate; sometimes collected in greater numbers in whirls or rings.

With respect to their construction, buds are composed of several parts artificially arranged. Externally, we find a number of scales that are pretty hard, frequently armed with hairs, hollowed like a spoon, and placed over one another like tiles. These scales are fixed into the inner plates of the bark, of which they appear to be a prolongation. Their use is to defend the internal parts of the bud, which, being unfolded, will produce, some, flowers, leaves, and stipulæ; others, foot-stalks and scales. All these parts, while they remain in the bud, are tender, delicate, folded over one another, and covered with a thick clammy juice, which is sometimes resinous and odoriferous, as in the tacahamac-tree. The external scales fall off after the entire expansion of the internal parts.

In general, we may distinguish three kinds of buds: that containing

containing the flower, that containing the leaves, and that containing both flower and leaves.

The firſt, termed *gemma floriſera*, and by the French, *bouton a fleur ou au fruit*, contains the rudiments of one or ſeveral flowers folded over one another, and ſurrounded with ſcales. In ſeveral trees, this kind of bud is commonly found at the extremity of certain ſmall branches which are ſhorter, rougher, and leſs garniſhed with leaves than the reſt. The external ſcales of this ſpecies of bud are harder than the internal; both are furniſhed with hairs, and in general, more ſwelled than thoſe of the ſecond ſort. The bud containing the flower, too, is commonly thicker, ſhorter, almoſt ſquare, leſs uniform, and leſs pointed, being generally terminated obtuſely. It is called by Pliny *oculus gemma*, and is employed in that ſpecies of grafting called inoculation or budding.

The ſecond ſpecies of bud, (that containing the leaves, termed *Gemma foliifera*, and by the French, *Bouton a feuilles ou a bois*,) contains the rudiments of ſeveral leaves which are variouſly folded over one another, and outwardly ſurrounded by ſcales, from which the ſmall ſtipulæ that are ſeated at the foot of the young branches, are chiefly produced. Theſe buds are commonly more pointed than the former ſort. In the hazel-nut, however, they are perfectly round; and in horſe-cheſnut very thick.

The curious and various ways in which the leaves are folded up in this kind of bud, are particularly enumerated under the article VERNATIO, which ſee.

The third ſort of bud is ſmaller than either of the preceding, and produces both flowers and leaves, though not always in the ſame manner.

Sometimes the flowers and leaves are unfolded at the ſame time. This mode of the flower-and-leaf-bud, is termed by Linnæus, *gemma foliifera & floriſera*, and admits of the following diſtinctions from the ſex of the flowers ſo produced with the leaves: male-flower and leaf-buds, as in the pine and fir-tree: female-flower and leaf-buds, as in hazel-nut and horn-beam: hermaphrodite-flower and leaf-buds, as in the elm-tree, cornel-tree, mezereon, and almond tree.

Sometimes the leaves emerge out of this kind of bud upon a ſmall branch, which afterwards produces flowers. This mode of the flower-and-leaf-bud, is termed by Linnæus, *gemma foliifero-florifera*, and is the moſt common bud of any.

Such buds as produce branches adorned only with leaves, are called barren; ſuch as contain both leaves and flowers, fertile: the varieties of the laſt have been juſt ſpecified. From the bulk of the bud we may often, with eaſe, foretel whether it contains leaves only, or leaves and flowers together, as in cherry and pear-tree.

The ſcales which envelop the bud, conſiſt chiefly of a cuticle or ſcarf-ſkin, and a parenchyma or medullary pulpy part. They are, as we have ſaid, for the moſt part, hairy, particularly in the margin; and the internal ſurface is covered with a ſlight down, in the ſame way as the leaves contained or folded up in the bud.

The thick clammy juice, which oozes from the ſcales and leaves of the bud, ſerves not only to defend the more tender parts of the embryo-plant from cold, the aſſaults of inſects, and other external injuries; but likewiſe from exceſſive perſpiration, which, in its young and infant ſtate, would be very deſtructive. This is conſpicuous in the buds of horſe-cheſnut, poplar, and willow-trees.

Neither the buds produced on or near the root, called by ſome authors turiones, nor thoſe produced on the trunk, and from the angles or wings of the leaves, contain, in ſtrict propriety, an entire delineation of the plant, ſince the roots are wanting: and in various buds, as we have ſeen, ſhoots are contained with leaves only, and not with flowers: but as a branch may be conſidered as a part ſimilar to the whole plant, and if planted, would, in proceſs of vegetation, produce roots and flowers, we may, in general, allow that the bud contains the whole plant, or the principles of the whole plant, and thus reſembles the ſeed, in containing a delineation of the future plant in embryo: for although the bud wants a *roſtellum* or radicle, of which the ſeed is poſſeſſed, yet it would undoubtedly form one, if planted in the earth.

earth. But as the medullary part adhering to the bud is too tender, and by the abundance of juice flowing into it from the earth, would be diſpoſed to putrefaction, the buds are not planted in the ſoil, but generally inſerted within the bark of another tree; yet ſo placed that the production of the marrow or pith adhering to them, may be inſerted into the pith of the branch in which the fiſſure or cleft is made; by which means there is a large communication of juice. This propagation by gems or buds, called inoculation, is commonly practiſed with the firſt ſort of buds above deſcribed.

From the obvious uſes of the buds, we may collect the reaſon why the ſupreme Author of Nature has granted this ſort of protection to moſt of the trees that are natives of cold climates: and, on the other hand, denied it to ſuch as, enjoying a warm benign atmoſphere, have not the tender parts of their embryo-ſhoots expoſed to injuries and depredations from the ſeverities of the weather. Of this latter kind are the plants of the following liſt, ſome of them very large trees; others, ſmaller woody vegetables, of the ſhrub and under-ſhrub kind:—Citron, orange, lemon, caſſava, mock-orange, blad-apple, ſhrubby ſwallow-wort, alaternus, ſhrubby geraniums, berry-bearing alder, Chriſt's thorn, Syrian mallow, baobab, or Æthiopian four-gourd, juſticia, wild ſenna, the acacias and ſenſitive plant, coral-tree, ſtinking bean-trefoil, medicago, oleander, viburnum, ſumach, ivy, tamariſk, heath, Barbadoes cherry, lavatera, rue, ſhrubby night-ſhades, Guinea henweed, cypreſs, lignum vitæ and ſavine a ſpecies of juniper.

On annual plants, whoſe root, as well as ſtalk, periſhes after a year, true buds are never produced; in their ſtead, however, are protruded ſmall branches like a little feather, from the wings of the leaves, which wither without any further expanſion, if the plants climb, and have no lateral branches; but if, either by their own nature, or from abundance of ſap, the plants become branched, the ramuli juſt mentioned obtain an increaſe ſimilar to that of the whole plant.

The

The ſame appearance obtains in the trees of warm countries, ſuch as thoſe enumerated in the above liſt, in which a plumula, or ſmall feather, ſends forth branches without a ſcaly covering, as in ſuch countries, this tender part requires no defence or protection from cold. A ſcaly covering then is peculiar to buds, as it protects the tender embryo encloſed from all external injuries. When we ſpeak, therefore, of trees having buds that are naked or without ſcales, our meaning is the ſame as if we had ſaid, that they have no buds at all.

Ray and Pontedera have inſtituted a diviſion of vegetables into herbs and trees from the buds. The former they have diſtinguiſhed by the name of plants wanting buds; the latter by that of plants bearing buds.

This diviſion, however, is certainly erroneous; moſt trees of warm climates being, as we have already ſhewn, devoid of buds, at leaſt of that ſcaly appearance which ſeems eſſential to every bud.

The buds that are to be unfolded the following year, break forth from the evolved buds of the preſent year, in ſuch a manner, as to put on the appearance of ſmall eminences in the wings or angles of the leaves. Theſe eminences or knots grow but little during the ſummer, as, in that ſeaſon, the ſap is expended on the increaſe of the parts of the plant: but in autumn, when the leaves begin to wither and fall off, the buds, placed on the wings, increaſe; and the embryo-plant contained in the bud, is ſo expanded, that the leaves and flowers, the parts to be evolved the following year, are diſtinctly viſible. Thus in horſe-cheſnut, the leaves, and in cornel-tree, the flowers, are each to be obſerved in their reſpective buds.

As each bud contains the rudiments of a plant, and would, if ſeparated from its parent-vegetable, become every way ſimilar to it, Linnæus, to ſhew the wondrous fertility of nature, has made a calculation by which it appears, that, in a trunk ſcarce exceeding a ſpan in breadth, ten thouſand buds (that is, herbs) may be produced. What an infinite

 number

number then of plants might be raiſed from a very large tree!

GEMMATIO, from *gemma*, a bud; a term uſed by Linnæus expreſſive of the form of the buds, their origin, and their contents. It includes both thoſe properly called buds, and thoſe which are ſeated upon the roots, ſtiled bulbs.

As to the origin of buds, they are formed either of the foot-ſtalks of the leaves, of *ſtipulæ*, or of ſcales of the bark. Their contents have been already diſcovered, in the preceding article, to be either flowers, leaves, or both. *Vide ſupra.*

GENERATIO. *Vide* SEXUS.

GENITALIA. By this appellation Linnæus and the ſexualiſts denominate the *anthers* and *ſtigma* of the flowers; the firſt, in their judgment, performing the function of the male organ of generation in plants, the other, of the female. *Vide* SEXUS.

GENITURA, the generating ſubſtance of plants. By this name, Linnæus, in his fancied analogy betwixt vegetables and animals, diſtinguiſhes, from its ſuppoſed uſe, the *pollen*, that fine powder or duſt, which, when ripe, is diſcharged by the *anthers* or tops of the ſtamina, and falls upon the *ſtigma*, for the purpoſe of impregnation. *Vide* POLLEN.

GENUS, a race or kind; one of the five members or parts into which every ſyſtem or regular method of arrangement reſolves itſelf.

A genus is an aſſemblage of ſeveral ſpecies; that is, of ſeveral plants which reſemble one another in their moſt eſſential parts. Hence it is aptly enough compared to a family, all the relations of which bear the ſame firname, although every individual is diſtinguiſhed by a particular ſpecific name.

The eſtabliſhment of genera renders botany more ſimple and eaſy, by abridging the number of names, and arranging under one denomination, termed the generic name, ſeve-

ral plants, which, though different in many other refpects, are found invariably to poffefs certain relations in thofe effential parts, the flower and fruit. Plants of this kind are termed by botanifts *plantæ congeneres*, that is, plants of the fame genus.

The works of Theophraftus, Diofcorides, Pliny and Galen, leave us no room to doubt that the antients had fome knowledge of plants: but they as certainly convince us, that their knowledge was extremely limited, and very fuperficial. In the ages which immediately fucceeded that of Pliny, little or nothing was done to enrich the fcience of plants. At length, all Europe was plunged in ignorance, and Botany lay neglected with every other ufeful art. On the revival of learning in the fifteenth century, men were folely devoted to the ftudy of the ancients, in order to recover that knowledge which had been fo long buried in obfcurity. Botanifts, therefore, if any there were, fearched for plants in the books of the Greeks and Romans. In the fequel, however, they perceived the imperfection and impropriety of fuch a mode of ftudy. The wide book of Nature lay open before them, and folicited their attention. They fought for plants in the fields. Botany foon wore a more agreeable afpect, and numbers of plants were daily added to the fcanty original lift. Thefe quickly pointed out the neceffity of having recourfe to an arrangement, and divifions determined by accurate and diftinct characters. Methods were invented, and thefe in progrefs of time fubdivided into claffes, genera and fpecies.

Genera, then, no more than Methods, feem to have been known to the ancients, in the fenfe in which that term is now generally underftood. Every fpecies with them was a genus; and they had no conception of giving a common name to a great number of plants which they could not difcover poffeffed any thing in common: for the reader will obferve that the minute parts of the fructification which lay the foundation of moft of our boafted fyftems, were then but little known, and lefs attended to. In fact, the port or habit of plants, their duration, place of growth, time of flowering, and

and their uſes both medicinal and œconomical, formerly furniſhed the ſole charecters of diſtinction. Conrad Geſner was the firſt, who, in 1559, ſuggeſted a diſtinction of plants into genera and ſpecies. In his letters to Fabricius, inſerted in the third book of his Collection, are the following paſſages, which may be reckoned deciſive on this head. "Generis unius polii ſpecies duæ ſunt. Novi et alias duas oreoſelini ſpecies. Exiſtimandum eſt autem nullas propemodum herbas eſſe quæ non GENUS aliquod conſtituant, in duas aut plures ſpecies diverſas dividendum. Gentianam unam priſci deſcribunt, mihi decem aut plures ſpecies notæ ſunt." Again, in a letter, dated 1559, he ſays, "Montana vero illa herba, flore quidem doronici, ſed foliis plantaginis, radice aromaticâ, ſui omnino GENERIS eſt. Oblectavit me etiam rarum illud piloſellæ GENUS." And again, "Mihi rara eſt etiam arthriticæ illa ſpecies——Miſiſti cum reliquis ſpeciem aquifoliæ nullis per marginem foliorum ſpinis præterquam in mucrone——Lunariam græcam quam phlitteren appellant multam jam hic habemus, ſed floribus inodoris; quibus odoratis, GENUS alterum reperiri audio hactenus mihi non viſum." Columna, who was poſterior to Geſner, entertained the ſame idea reſpecting the diſtribution into genera and ſpecies: as did likewiſe Joachim Jungius, who died in 1657, in whoſe poſthumous works, publiſhed in 1679, under the title of Iſagoge Phytoſcopica, is the following paſſage: "Plantæ, niſi certo in GENERA & SPECIES conſtanti ratione, non pro lubitu hujus vel illius, redigantur, infinitum quaſi reddetur Phytoſcopiæ ſtudium; intellectus autem humanus infinitum fugit.——Ordo autem claſſium, generum, ſpecierum, terminum infinitis ponit."

This doctrine of Conrad Geſner, Columna and Jungius was adopted by ſucceeding botaniſts, from Cluſius who was contemporary with them, to J. Bauhin. They arranged ſeveral ſpecies of plants under the ſame generic name, as iris, narciſſus, or willow: but the genera were ſtill vague and undetermined.

In 1655, Moriſon attempted to eſtabliſh the genera on a certain foundation, as did likewiſe the celebrated Ray in 1682,

1682, and Rivinus in 1690. The characters, however, which they affigned, were far from being fatisfactory or fufficient: and Ray himfelf was fo fenfible of their defects, that he afterwards changed his for thofe of Tournefort.

This illuftrious botanift was the firft who, in 1694, propofed a fatisfactory diftribution of the genera, founded on the parts of the fructification, and determined by fixed and precife characters common to feveral fpecies of plants. A genus of plants, as defined by Tournefort, is an affemblage of feveral fpecies which agree in all the parts of fructification or the moft effential. This is properly what Tournefort calls a primary genus, or genus of the firft order. His Secondary Genera will be explained below.

The rules eftablifhed on this fubject by the French botanift, are as follow.

I. The parts of fructification, when prefent in plants, are folely to be employed as characteriftical marks in difcriminating the genera, if found fufficient for that purpofe.

II. If thefe marks are found infufficient, recourfe muft be had to other parts lefs effential—as the roots, ftems, bark, and number of leaves; to the fenfible qualities of plants, as their colour and tafte; or to their port and external habit.

III. With refpect to plants in which the parts of the flower and fruit are wanting, or not to be difcovered without the affiftance of glaffes, the genus is to be fixed from the moft remarkable of the characters mentioned in the laft paragraph.

IV. All fuperfluous marks are to be rejected.

V. A greater fhare of attention is to be paid to the general habit of plants, than to the particular varieties, which can only be difcovered by nice and minute obfervation. Thus, although the large common trefoil, and fome other flowers of the fame genus, are only furnifhed with one petal, they are by no means to be feparated from the other fpecies, which, like moft pea-bloom flowers, have four irregular petals; becaufe they agree with them in more ftriking characters. Some fyftematic writers, however, have been abfurd enough to advance, that a difference in the number of

petals

petals and feeds, is a fufficient foundation for forming different genera from plants otherwife very nearly allied; and, in fhort, that a flower having only one petal or one feed, can never be referred to the fame genus with a flower having two, three, four, or more petals or feeds. The abfurdity of this doctrine appears from hence, that, were the rule in queftion to be ftrictly followed, we fhould fometimes refer to different genera, different individuals of the fame fpecies. From the feed of papaw, are produced both male and female plants, that is, plants which have male and female flowers on diftinct roots. The male flowers have always one petal, the female five. The fame thing obtains in the male and female flowers of caffada, which indeed are not placed on diftinct roots as the former, but ftand apart within different covers on the fame plant.

Thefe rules, which are delivered and illuftrated at great length in the Preface to the Inftitutions, led the author to diftinguifh two forts of genera, under the appellations of genera of the firft order, and genera of the fecond. The genera of the firft order are fuch as Nature herfelf appears to have inftituted, and accurately diftinguifhed by the flower and fruit; fuch are violet, ranunculus, aconite, paffion-flower, and feveral others. Thefe are the only genera which Linnæus admits: or, to fpeak more properly, all the genera of plants are, by this author, rendered primary, whether the characters derived from the parts of the flower and fruit are fufficient for the purpofe of difcrimination, or not.

The genera of the fecond order are thofe, for the diftinction of which we muft have recourfe, not only to the fructification, but to parts that are unconnected with the flower and fruit, by reafon of the infufficiency of thefe laft to difcriminate the genera of themfelves.

Thus, according to Tournefort, germander forms a genus different from poley mountain, *teucrium* and ground pine, on account of its hollow *calyx*, and the difpofition of its flowers in the wings or angles of the leaves.—Poley mountain is diftinguifhed from *teucrium*, ground-pine and germander, by its flowers, which are collected in a head or round fpike:

teucrium

teucrium from the three others by its bell-ſhaped *calyx*; and ground-pine by the diſpoſition of its flowers, which proceed ſingly from the wings of the leaves, and not in whirls or rings, as in germander.

Theſe ſecondary genera, which Tournefort uſes but rarely, are entirely rejected by Linnæus, who has eſtabliſhed as a principle in no caſe to be departed from, that the *generic* characters are to be derived from all the parts of fructification, and none other. A total revolution of the genera muſt evidently be the conſequence of a rigid obſervance of this principle: and in fact, not the ſecondary genera of Tournefort only, but many of his primary genera which were eſtabliſhed upon the ſame principle, have felt the effects of this undiſtinguiſhing ſeverity. Linnæus's genera, then, contain a deſcription of each particular part of fructification, its various relations, and different modes with reſpect to number, figure, ſituation, and proportion.

Thus, all the different ſpecies of *calyx*, *corolla*, *nectarium*, *ſtamina*, *&c.* conſidered with reſpect to the four attributes juſt mentioned, furniſh the obſerver with ſo many ſenſible and eſſential characters.

Theſe characters the author denominates the letters or alphabet of botany. By ſtudying, comparing, and, as it were, ſpelling theſe letters, the ſtudent in botany comes, at length, to read and underſtand the generical characters which the great Creator has originally imprinted upon vegetables: for the genera and ſpecies, according to Linnæus, are ſolely the work of Nature; whilſt the claſſes and orders are a combination of nature and art.

Upon theſe principles, Linnæus, in his *Genera Plantarum*, determines the generical characters of all the plants there deſcribed.—His method will be beſt illuſtrated by an example.

NARCISSUS.

Calyx—A *ſpatha* or ſheath, which is oblong, obtuſe, compreſſed, tears open on the ſide, and withers upon the plant.

Corolla.

COROLLA—Six *petals*, or rather one *petal* cut almoſt to the bottom into ſix parts, which are oval, terminated in a point, flat, and inſerted externally above the baſe of the tube of the *nectarium*, which is ſituated in the middle of the flower, bell or funnel-ſhaped, and commonly called the cup.

STAMINA—Six awl-ſhaped *filaments*, ſhorter than the *nectarium* and attached to its tube—The *anthers* or *ſummits* oblong.

PISTILLUM—The *ſeed-bud* roundiſh, obtuſely triangular and placed under the receptacle of the flower. The *ſtyle* thread-ſhaped, and longer than the *ſtamina*.—The *ſtigma* or *ſummit of the ſtyle* divided into three parts, hollow and blunt.

SEED-VESSEL—A *capſule* that is roundiſh, obtuſely three cornered, having three external openings or valves, and the ſame number of internal diviſions or cells.

SEEDS—Numerous, globular, and furniſhed with an appendage or border. The *receptacle* to which they are fixed is ſhaped like a pillar.

By this manner of deſcribing all the parts of the fructification, almoſt innumerable combinations are produced of the botanical letters; I mean the generical characters of plants are multiplied, and furniſh an amazing diverſity of relations.

Some characters are common to ſeveral genera, independently of thoſe which conſtitute the claſs and order. Thus ſnow-drop, greater ſnow-drop, and ſea-daffodil, which belong to the ſame claſs and order with narciſſus, agree with it not only in the number of the *ſtamina* and ſtyles which, in the ſexual ſyſtem, lay the foundation of the two primary diviſions, but likewiſe in the form and nature of the *calyx*, which, in all theſe genera, is a *ſpatha* or ſheath. By comparing the other characters, we diſcover, in like manner, thoſe which are ſimilar, and thoſe which are diſtinctive. Thus, in greater ſnow-drop, the diſtinctive character is the bell-ſhaped petal: in ſnow-drop, the *galanthus* of Linnæus, the three-leaved *nectarium*; and in ſea-daffodil, the *nectarium* divided into twelve parts.

It

It is, as we have said, in the *Genera Plantarum*, that these full descriptions of all the parts of fructification are to be found. In the *Systema Naturæ*, another work of the same author, those characters that are common to all the genera of the same class and order are omitted, and the distinctive characters or generic differences alone are mentioned.—Tournefort, knowing his method to be artificial, did not pretend to assert that his genera were otherwise. Linnæus, however, we have seen, has carried his pretensions further, and affirms that all genera as well as species are natural. What seems to favour this assertion is the striking appearance of the flowers of certain genera, as ranunculus, violet, aconite, fennel-flower, syrian-mallow, passion-flower, and several others which have essential and uniform characters, that, at first sight, seem to entitle them to the appellation of natural genera. But to this it may be answered, that for the comparatively small number of genera which have striking distinctive characters of this kind, there are many, particularly in some natural families, as the umbelliferous plants, lipped, cross-shaped, and pea-bloom flowers, in which the characters in question are so little conspicuous, and the plants so remarkably similar, that one is frequently tempted to make but a single genus of each of these families.

Linnæus has described about twelve hundred and thirty-nine genera, that is, upwards of five hundred more than Tournefort, the number of whose genera amounts, I think, to six hundred and ninety-eight. We must observe, however, that the former frequently incorporates several genera which had been divided by the latter. Such, for instance, are germander, teucrium, mountain-poley, and ground pine, which the French botanist has distinguished, as was observed above, into so many genera of the second order, by characters independent of the fructification. Linnæus, however, employing these characters only for distinguishing the species, and finding essential relations to subsist betwixt the parts of fructification of the Tournefortian genera in question, collects them all under one head; so that instead of four

four diſtinct genera, they become as many ſpecies of the ſame genus.

Beſides the ſix hundred and ninety-eight genera of Tournefort, Linnæus's books contain ſeveral new genera of other botaniſts, who lived poſterior to Tournefort. The moſt remarkable of theſe are, Father Plumier, who eſtabliſhed about ninety-ſix genera of American plants; Boerhaave, who deſcribed ſeventeen new genera; Vaillant, thirty; Dillenius, ſixty-ſeven; Micheli, twenty-ſeven; Houſton, fifteen; Petit, Meſſieurs de Juſſieu, Niſſole, Marchant, Danti, Reneaume, Ruppius, Pontedera, Scheuchzer, Buxbaum, Ammannus, Haller, Gmelin, Monti, Gronovius, Mitchel, Cateſby, Kæmpfer, &c. have publiſhed in all about fifty new genera. The remaining genera, to the number of two hundred and upwards, are publiſhed by Linnæus himſelf.

I conclude this article with a few aphoriſms reſpecting the genera of plants as laid down by Linnæus in his Philoſophia Botanica.

I. There are few genera in which all the parts of fructification are conſtant throughout the ſpecies.

To this inconſtancy is owing the great number of fictitious or ſpurious genera in Tournefort and other authors: for although ſuch varieties afford excellent ſpecific diſtinctions, they are not ſtriking enough to conſtitute real ſcientific genera. The author very pertinently adds, if genera were to be multiplied in this manner without any neceſſity, we ſhould ſoon have as many genera as ſpecies, and the ſcience of botany, as far as it reſpects arrangement, be at an end.

II. If an unneceſſary multiplication of the genera is to be avoided on the one hand, an unneceſſary reduction of them is no leſs to be ſhunned on the other. From the affinity of ſome genera to claſſes and orders, we frequently incur the danger of throwing all into confuſion, by reducing under one genus a whole natural aſſemblage or family. Some of the natural orders whoſe plants have a very ſimilar appearance, were enumerated above. Many plants of the mallow

tribe, as mallow, marſh-mallow, holly-hock, lavatera, urena, and Syrian mallow, are of the ſame kind.

The following parcels of genera, which belong to other natural orders, are very ſimilar in their appearance, and might each, by an inaccurate obſerver, be confounded under one genus.

Houſe-leek, leſſer houſe-leek, navel-wort, leſſer orpine, and tillæa.

Torch-thiſtle, fig-marigold, aizoon, and tetragonia.

Campion, wild lychnis or agroſtemma, viſcous campion, carnation, ſoapwort, ceraſtium, ſpurrey, ſandwort, moerhingia, and ſagina.

In this manner, ſeveral natural orders might each be reduced to a ſingle genus, and thus the ſcience be as effectually deſtroyed by the enormous ſize of the genera, as formerly by the unneceſſary multiplication of their number.

III. A genus may conſiſt of one ſpecies only, although it is moſt commonly compoſed of a greater number.

The following genera, among many others, conſiſt of only one ſpecies:

Graſs of Parnaſſus, tamarind, baſtard cumin, ſand-box-tree, barren-wort, horn-of-plenty-graſs, ſuperb lily, water-leaf, neurada, calligonum, African fly-honey-ſuckle, leaſt water-plantain, corymbium, caſhew-nut, coris, nepenthes, hop, flowering-ruſh, baſtard-indigo, mangoſtan and orvala.

Other genera, as the following, conſiſt of a great number of ſpecies:

Fig-marigold, leſſer houſe-leek, bind-weed, ſaxifrage, acacia, calves-ſnout, milk-wort, aſter, carex, burning thorny plant, geranium, campanula, viſcous campion, wild ſenna, St. John's wort, kidney-bean, cud-weed, willow, fig-tree, French honey-ſuckle, hemp-agrimony, aloe, aſtragalus, blue-bottle, Syrian mallow, wild orach, flax, ranunculus, gentian, night-ſhade, thrift, heath, garlick, ox-eye, and cinquefoil.

IV. In many genera, ſome ſtriking or eſſential mark of fructification is obſerved.

Thus the eſſence of ranunculus conſiſts in its nectarium, which

which is a ſmall prominence in the claw of each petal: that of ſelf-heal, torenia, eye-bright, mad-wort, and ſea-cabbage, in the denticuli or ſmall teeth with which the ſtamina are furniſhed: that of martynia, turmeric, bignonia, and chelone, in a pointed body which is placed within the ſtamina, and reſembles a filament without its anther: that of hellebore and fennel-flower, in its numerous hollow *nectaria*: that of water-leaf, in its cloſed chinks, (*rimæ clauſæ*) within the diviſions of the petal: that of henbane, in the covering of its ſeed-veſſel, by which it is diſtinguiſhed from alkekengi: that of ſea-daffodil, in the inſertion of its ſtamina into the upper part of the nectarium, by which it is diſtinguiſhed from narciſſus, where the ſtamina are placed within the nectarium, and affixed to its tube: that of baſtard-rocket, and bell-flower, in their nectarium: laſtly, that of iris, in its ſingular *ſtigma*, which reſembles three petals, or leaves.

V. The ſtriking or ſingular characteriſtical mark of every genus muſt run through all the ſpecies. Without a ſtrict attention to this rule, we might be apt to confound genera that ſhould be diſtinguiſhed. It was for want of this caution that aloe and American aloe were formerly incorporated into one genus; as were likewiſe ranunculus and adonis, andromeda and heath.

Aloe is now ſeparated from American aloe, (*Agāve*) becauſe its ſtamina are inſerted, not into the petals, but into the common receptacle; adonis from ranunculus, becauſe it wants the prominence in the claw of the petal, which is the diſtinguiſhing mark of the latter; andromeda from heath, becauſe of the two horns of the anthers, which are more conſpicuous in the latter than the former.

VI. Plants which are of the ſame genus, poſſeſs like medicinal powers. The truth of this aphoriſm will be beſt illuſtrated by attending to the following liſt of *congeneres*.

Scammony, turbith, jalap, and ſea bind-weed belong to the genus *convolvulus*.

Moly, leek, onion, and garlick, belong to the genus *allium*.

Cinnamon, camphire, benjamin-tree, ſaſſafras, and avocado pear, belong to the genus *laurus*.

Southernwood

Southernwood and wormwood belong to the genus *artemisia*.

GENUS *summum*, a termed ufed by Rivinus and Ray, fynonymous to CLASSIS in Linnæus, and ORDO in Tournefort.

GENUS *fubalternum*, another term ufed by the fame botanifts, fynonymous to ORDO in Linnæus, and SECTIO in Tournefort.

GERMEN, the feed bud; defined by Linnæus to be the bafe of the piftillum, which contains the rudiments of the feed, and, in progrefs of vegetation, fwells and becomes the feed-veffel.

When the feed-bud is placed above the receptacle, or, in other words, within the cover or covers of the flower, it is termed *germen fuperum*; when fituated below the receptacle, or under the calyx, *germen inferum*. The former, which correfponds to *flos inferus*, is exemplified in fumach, *hippuris*, *wachendorfia*, *commelina*, *xyris*, and the graffes;—the latter, fynonymous with *flos fuperus*, in valerian, iris, *gladiolus*, epilobium, œnothera, viburnum, elder, and the umbelliferous and cucurbitaceous plants.

In affimilating the vegetable and animal kingdoms, Linnæus denominates the feed-bud the *ovarium* or *uterus* of plants, and affirms its exiftence to be chiefly at the time of the difperfion of the male-duft by the anthers; as, after its impregnation, it becomes a feed-veffel.

GERMEN, by Pliny and the ancient botanifts, is ufed to fignify a bud containing the rudiments of the leaves. *Vide* GEMMA.

GERMINATIO, comprehends the precife time which the feeds take to rife after they have been committed to the foil.

The different fpecies of feeds take longer or fhorter time in rifing, according to the degree of heat which is proper for each. Millet, wheat, and feveral of the graffes, rife in one day; blite, fpinach, bean, muftard, kidney-bean, turnip, and rocket, in three days; lettuce and dill, in four; cucumber, gourd, melon, and crefs, in five; radifh and beet,

beet, in ſix; barley, in ſeven; orach, in eight; purſlane, in nine; cabbage, in ten; hyſſop, in thirty; parſley, in forty or fifty days; peach, almond, walnut, cheſnut, pæony, horned poppy, hypecoum, and ranunculus falcatus, in one year; roſe-buſh, cornel-tree, hawthorn, medlar, and hazel-nut, in two. The ſeeds of ſome ſpecies of orchis, and of ſome liliaceous plants, never riſe at all. Of ſeeds, ſome require to be ſowed almoſt as ſoon as they are ripe, as otherwiſe they will not germinate. Of this kind are the ſeeds of coffee and fraxinella. Others, particularly thoſe of the pea-bloom flowers, preſerve their germinating faculty for a ſeries of years.—M. Adanſon aſſerts, that the ſenſitive plant retains that virtue for thirty or forty years.

Air and water are the agents of germination. The humidity of the air alone makes ſeveral ſeeds to riſe that are expoſed to it. Seeds too are obſerved to riſe in water, without the intervention of earth: but water, without air, is inſufficient.—Mr. Homberg's experiments on this head are deciſive. He put ſeveral ſeeds under the exhauſted receiver of an air-pump, with a view to eſtabliſh ſomething certain on the cauſes of germination. Some of them did not riſe at all; and the greater part of thoſe which did, made very weak and feeble productions.

Thus it is for want of air, that ſeeds which are buried at a very great depth in the earth, either thrive but indifferently, or do not riſe at all.

They frequently preſerve, however, their germinating virtue for many years, within the bowels of the earth; and it is not unuſual, upon a piece of ground being newly dug to a conſiderable depth, to obſerve it ſoon after covered with ſeveral plants, which had not been ſeen there in the memory of man.

Were this precaution frequently repeated, it would doubtleſs be the means of recovering certain ſpecies of plants which are regarded as loſt; or which, perhaps, never coming to the knowledge of botaniſts, might hence appear the reſult of a new creation.

Some

Some feeds require a greater quantity of air than others. Thus purflane, which does not rife till after lettuce in the free air, rifes before it in vacuo; and both profper but little, or perifh altogether, whilft creffes vegetate as freely as in the open air.

GLANDULA, a fpecies of fecretory or excretory veffel that is found on the furface of fome plants.

Glands are feated either on the footftalks, on different parts of the leaves, or on the tender ftipulæ. They refemble fometimes a blifter or bladder, as in St. John's wort; fometimes a number of fcales, as in fern; fometimes feveral fmall grains like millet, as in fir-tree; at other times a little cup, as in apricot-tree; fometimes too they appear by a microfcope to be fupported by footftalks; and often to be feated upon the leaves without any footftalk.

All thefe bodies appear to be produced by the fwelling of fome portion of the cellular or parenchymatous fubftance. From many of them oozes a vifcous liquor, which, drying upon the plant, forms a fine white powder, and a number of flender threads, that are frequently to be feen furrounding the glands in queftion. Hence it has been concluded that they are the organs of fome fecretion; but it is not yet afcertained, whether that is their fole function.

In palma chrifti, caffava, paffion-flower, wild fenna, and acacia, the glands are feated on the footftalks.

In willow-tree they are placed on the indented or fawed margin of the leaves: in almond-tree, gourd, heliocarpus, balfam, gelder-rofe, and bird-cherry, they proceed from the bafe of the leaf: in urena, tamarifk, and baftard ricinus, from its back; in butter-wort and fun-dew, from the upper furface.

In mountain ebony and apricot-tree, the glands are feated upon the tender ftipulæ or fcales which furround the young footftalks of the flower and leaves.

The glands in currant-tree, a fpecies of calve's fnout, ceraftium, fig-wort, and vifcous campion, are flender like hairs, and are hence denominated *glandulæ capillares*.

The pores or fmall holes obfervable on the furface of fome plants,

plants, as tamarisk, and a species of viscous campion, are reduced by Linnæus under the term *glandulæ* which we are now considering.

The glands furnish excellent characteristical marks for discriminating the species of plants. Thus the almond-tree can scarce be distinguished from the peach, but by its glands, which are seated at the base of the leaves, upon the serratures: whereas, in the peach-tree, there is no appearance of this kind. A species of convolvulus with a pimpled or knotty calyx, is so variable in the shape of the leaves, as to justify its division into several species; yet it is kept entire by the constancy of the glands, which are placed upon the leaves. In a species of monarda, the petal is covered over with glands; an appearance which evidently distinguishes it from all the plants of the same genus.

The prickles of *bauhinia aculeata* are covered with glands of the same kind.

A glandular appearance is frequently to be observed betwixt the stamina of some plants, particularly in the cross-shaped flowers, (*Tetradynamia*) in which Linnæus reckons it an essential classical character.

GLANDULATIO, from *glandula*, a term respecting the vessels of secretion in plants, which are, by Linnæus, reckoned three: viz. GLANDULÆ, FOLLICULI and UTRICULI.

GLUMA, a husk; the calyx of the grasses, composed of one, two, or three valves, a kind of scales commonly transparent in the margin, and most frequently terminated by a pointed thread termed the *arista*, or beard. *Vide* GRAMINA *et* ARISTA.

GLUMOSUS *Flos*, a species of aggregate flower so called, which has a slender thread-shaped receptacle, along which are placed a number of florets or partial flowers; the base being furnished with a common husky calyx, termed by Linnæus *gluma*. Of this kind are bromus, fescue grass, oats, reed, poa, wheat, and other grasses.

GLUMOSÆ, the name of a class in Linnæus's *Methodus Calycina* and Wachendorffius's Natural Method, consisting of

of plants which have that particular ſpecies of calyx called a gluma or huſk.—It contains all the natural order of the graſſes.

GLUTINOSITAS, from *gluten*, glue; a term occurring in the *Delineatio Plantæ* prefixed to the *Syſtema Naturæ*, and placed under the general head *pubes*; it ſeems to denote that ſtiff clammy matter which is ſometimes found on the ſurface of the leaves and ſtalks of plants.

GRAMINA, graſſes; one of the ſeven tribes or natural families, into which all vegetables are diſtributed by Linnæus in his *Philoſophia Botanica*. They are defined to be plants which have very ſimple leaves, a jointed ſtem, a huſky calyx termed *gluma*, and a ſingle ſeed. This deſcription includes the ſeveral ſorts of corn as well as graſſes. In Tournefort they conſtitute a part of the fifteenth claſs, termed *apetali*; and in Linnæus's Sexual Method, they are moſtly contained in the ſecond order of the third claſs, called *triandria digynia*.

This numerous and natural family of the graſſes, has engaged the attention and reſearches of ſeveral eminent botaniſts. The principal of theſe are, Ray, Monti, Micheli and Linnæus.

Giuſeppe Monti, in his Catalogus Stirpium agri Bononienſis, gramina ac hujuſmodi affinia complectens, printed at Bologna, in 1719, divides the graſſes from the diſpoſition of their flowers, as Theophraſtus and Ray had divided them before him, into three ſections or orders.——Theſe are,

SECTION I.

Graſſes having flowers collected in a ſpike.

SECTION II.

Graſſes having their flowers collected in a panicle or looſe ſpike.

SECTION III.

Plants that in their habit and external appearance are allied to the graſſes.

This claſs would have been natural, if the author had not

 improperly

improperly introduced ſweet-ruſh, juncus, and arrow-headed graſs into the third ſection. Monti enumerates about 306 ſpecies of the graſſes, which he reduces under Tournefort's genera; to theſe he has added three new genera.

Scheuchzer, in his Agroſtographia, ſeu Graminum, Juncorum, Cyperorum et Cyperoidum iiſque affinium hiſtoria, publiſhed likewiſe in 1719, divides the graſſes, as Monti, from the diſpoſition of their flowers, into the five following ſections:

SECTION I.

Graſſes with flowers in a ſpike, as phalaris, anthoxanthum and frumentum.

SECTION II.

Irregular graſſes, as ſchœnanthus and cornucopiæ.

SECTION III.

Graſſes with flowers growing in a ſimple panicle or looſe ſpike, as reed and millet.

SECTION IV.

Graſſes with flowers growing in a compound panicle or diffuſed ſpike, as oats and poa.

SECTION V.

Plants by their habit nearly allied to the graſſes, as cypreſs-graſs, ſcirpus, linagroſtis, ruſh and ſcheuchzeria.

Scheuchzer has enumerated about four hundred ſpecies, which he deſcribes with amazing exactneſs.

Micheli has divided the graſſes into ſix ſections, which contain in all forty-four genera, and are arranged from the ſituation and number of the flowers.

GRAMINA. The name of the fourth order in Linnæus's Fragments of a Natural Method, conſiſting of the extenſive natural family of the graſſes.

List of Genera *contained in this Natural Order.*

SECTION I.

Grasses having Hermaphrodite Flowers.

Linnæan Genera.		English Names.
Agrostis,	— —	Bent-Grass.
Aira,	— —	Hair-Grass.
Alopecurus,	— —	Fox-tail grass.
Anthoxanthum,	— —	Vernal grass.
Aristida.		
Arundo,	— —	Reed.
Avena,	— —	Oats.
Bobartia.		
Briza,	— —	Quaking grass.
Bromus,	— —	Brome grass.
Cinna.		
Cornucopiæ,	— —	Horn-of-plenty grass.
Cynosurus,	— —	Dog's-tail grass.
Dactylis,	— —	Cock's-foot grass.
Elymus.		
Festuca,	— —	Fescue-grass.
Hordeum,	— —	Barley.
Lagurus,	— —	Hare's-tail grass.
Lolium,	— —	Darnel.
Lygeum,	— —	Hooded matweed.
Melica.		
Milium,	— —	Millet.
Nardus.		
Oryza,	— —	Rice.
Panicum,	— —	Panic-grass.
Paspalum.		
Phalaris,	— —	Canary-grass.
Phleum,	— —	Cat's-tail grass.
Poa,	— —	Meadow grass.
Saccharum,	— —	Sugar-cane.

Linnæan Genera.			English Names.
Secale,	—	—	Rye.
Stipa,	—	—	Winged ſpike-graſs.
Triticum,	—	—	Wheat.
Uniola,	—	—	Sea-ſide oats of Carolina.

SECTION II.

Graſſes having Male and Female Flowers upon the ſame Root.

Linnæan Genera.			English Names.
Coix,	—	—	Job's tears.
Olyra.			
Pharus.			
Tripſacum.			
Zea,	—	—	Indian, or Turkey wheat, Indian corn.
Zizania.			

SECTION III.

Graſſes with Hermaphrodite and Male Flowers on the ſame Root.

Linnæan Genera.			English Names.
Aegilops,	—	—	Wild feſcue-graſs.
Andropogon.			
Apluda.			
Cenchrus.			
Holcus,	—	—	Indian millet.
Iſchæmum.			

Habit and Structure of the Plants of this Order.

Moſt of theſe plants are annual or perennial herbs; ſome of them are erect, others creep upon the ground.

The Roots, in the greateſt number, creep, and emit fibres

fibres from each knot or joint: in others, they are ſimply branched and fibrous.

The STEMS and branches are round.

The LEAVES are ſimple, alternate, entire, very long, and commonly narrow. They are generally placed immediately upon the ſtem, except in bamboo, pharus, a new ſpecies of reed called *guieraat ſenegal*, and a ſpecies of Iſchæmum, which have a foot-ſtalk at the origin of the leaves.

The leaves form below a ſort of ſheath, which embraces the ſtem, and is generally cleft on one ſide through its whole length. In two ſpecies of melica, mentioned by M. Adanſon, the ſheath in queſtion is perfectly entire.

The top of the ſheath is ſometimes crowned with a membrane, that is either cleft or entire, and is frequently accompanied with two appendages or ears, as in rice, pharus, darnel, wheat, rye, and barley. In others, the ſheath is crowned with hairs, as in millet, panic-graſs, and andropogon; and in ſome ſpecies of panic graſs it is naked; that is, has neither membrane nor hairs.

The FLOWERS are hermaphrodite in plants of the firſt ſection; male and female upon the ſame root in thoſe of the ſecond; hermaphrodite and male on the ſame root in thoſe of the third.

They proceed either ſingly from the ſheath of the leaves, as in lygeum; form a ſingle ſpike, as in nardus and darnel; or are formed into a panicle, that is, looſe ſpike, as in poa, agreſtis, and oats.

The CALYX and COROLLA in this order, are not ſufficiently aſcertained. In ſome, a ſingle ſcale or huſk, in others two, as in nardus, ſupply the place of both covers; ſome graſſes, as canary-graſs, and phleum, have four huſky ſcales, two of which ſerve for the calyx, and the other two for the corolla; ſome have five, as anthoxanthum; others ſix, as rice, four of which are ſuppoſed to conſtitute the calyx, and the other two are termed, improperly enough, the huſky petals.

The corolla is ſometimes compoſed of one petal with two diviſions,

divifions, as in fox-tail grafs. In general, the hufks of the calyx are placed oppofite to thofe of the corolla.

Befides the hufky fcales that have been mentioned, there are two other fmall fquare fcales, placed by each other, betwixt the feed-bud and the external hufk of the corolla.

Thefe fcales are not always to be feen without the affiftance of a magnifying glafs; and in fome, as panic-grafs and cenchrus, they are entirely wanting. Laftly, the calyx and corolla, if indeed they are to be confidered as diftinct covers, are frequently accompanied with an arifta or fharp-headed awn, which fometimes terminates the hufk, fometimes proceeds from the middle or bafe of its back. In oats, wheat and barley, thefe fharp beards are frequently made to difappear by culture. Some graffes have, befides the calyx, a cover which accompanies or furrounds the flowers under the form of a fcale, and is varioufly cut, and of a very different figure from that of the leaves.

The calyx and corolla, or rather the hufky fcales which refemble them, always accompany the feed-bud to its maturity. Upon the whole, I am of opinion, that former botanifts were not greatly miftaken, when they denominated the graffes *plantæ apetalæ*, plants which want petals; as the hufky fcales are, perhaps, with much more propriety, to be denominated a calyx.

The STAMINA are generally three in number, and placed irregularly, with refpect to the fituation of the calyx and the corolla. One ftamen is commonly placed betwixt the feed-bud and the two fmall fcales or external hufk of the corolla; and two betwixt the feed-bud and the inner hufk. Rice, zizania, and pharus, have fix ftamina.

The ANTHERS are long, furnifhed with two cells, and flightly attached to the fil ments.

The SEED-BUD is placed upon the fame receptacle as the calyx, corolla and ftamina. In bobartia it is faid to be placed under the receptacle of the flower.

The STYLE is generally double, and crowned with a hairy *ftigma* or fummit.

The

The SEED-VESSEL in this order is wanting.

The SEEDS are ſingle, oval, and attached below to the bottom of the flower.

The roots of the graſſes are aperient; ſuch as have an aromatic ſmell are ſtomachic; their ſeeds are meally, mucilaginous and nouriſhing.

All the parts of theſe plants are wholeſome. The leaves of ſuch as are not too rough to the touch, are browzed upon by animals; the large ſeeds, as of wheat, rye, barley, oats, &c. are daily converted into food for men; the ſmaller ſeeds, as of canary-graſs, and panic-graſs, afford a very excellent repaſt to ſparrows and other birds; and, in times of ſcarcity, the tuberous roots of ſome of the eſculent graſſes are no bad ſuccedaneum, in default of their ſeeds.

Of a ſpecies of reed, which grows plentifully in Syria and Paleſtine, the Turks make their writing pens.

The ſtalks of *arundo donax* are uſed for fiſhing-rods.

There are two ſorts of reed, ſays Haſſelquiſt, which grow near the Nile: one of them has ſcarce any branches, but is furniſhed with numerous leaves, that are narrow, ſmooth, and channeled on the upper ſurface; and the plant is about eleven feet high. The Egyptians make ropes of the leaves. They lay them in water like hemp, and then make them into good ſtrong cables. Theſe, with the bark of the date-tree, are almoſt the only cable uſed in the Nile. The other ſort is of great conſequence. It is a ſmall reed, about two or three feet high, full branched, with ſhort, ſharp, lancet-ſhaped leaves. The roots, which are as thick as the ſtem, creep and mat themſelves together to a conſiderable diſtance. This plant ſeems uſeleſs in common life; but to it, continues the learned author, is the very ſoil of Egypt owing: for the matted roots have ſtopped the earth, which floated in the waters, and thus formed out of the ſea, a country that is habitable.

Bamboo Cane, the Arundo Bambos of Linnæus, the Ily or Ilii of the Hortus Malabaricus, grows naturally in ſandy places, and on the banks of rivers in both Indies, where it frequently attains a height exceeding even that of the

cocoa-

cocoa-tree. The root is not very different from the ſtem, unleſs that it is of a whitiſh colour, and conſiſts of ſeveral radicles or fibres. From the joints of the main root are emitted ſmall jointed ſtalks, which again emit others from their joints; and from theſe, as from ſo many new roots, ariſe ſeveral ſtalks joined together, which being planted with their radicles, or ſtring roots, ſerve to perpetuate the ſpecies. Theſe ſtalks are round, have a green bark, are hard, emit from the joints new branches and twigs, and are armed in the joints themſelves with one, two, or more rigid and acute thorns of an oblong figure. It is to be obſerved, however, that the ſtalks in queſtion, ariſing, as we have ſaid, immediately from the root, have attained in their native ſoil the height of two or three men, and the thickneſs of almoſt a ſpan, before they ſend forth any lateral branches. Theſe, when young and tender, are nearly ſolid, pervious only in the middle by a ſmall tube. The older ſtalks and branches are hollow within, being ſhut, however, at the joints with a woody partition, and covered internally with a ſlender whitiſh membrane that is compoſed of hard, white, woody filaments. The colour of the ſtalks, when young, is a browniſh green; when older, a ſhining yellow with a ſhade of white. The leaves are long, narrow, ſeated on ſhort footſtalks, ſtreaked with longitudinal veins, and rough on the edges, if rubbed downwards. The flowers grow in long ſcaly ſpikes, which proceed in great numbers from the joints of the ſtalks. Rheede mentions a tradition prevailing on the coaſt of Malabar, that the bamboo vegetates till its ſixtieth year; at which period of its growth, and nearly a month before the flowers emerge from their ſcaly covers, the tree is diveſted of all its leaves, and after it has ceaſed to flower, immediately dies. This tree or reed is termed by the inhabitants of Ceylon, UNAGHAS, that is, Fever-tree, from an opinion generally entertained in that iſland, that a fever is the certain conſequence of bathing in any river into which the flowers or leaves of the bamboo have fallen. By the Arabians it is named Tabaxir, as is likewiſe a milky humour or ſugar produced in it. The

Indians

Indians call it Mambu; whence vulgarly and by corruption, its European name of Bambu, or Bamboo. In the iſland of Madagaſcar, and particularly in the province of Galemboulou, by the teſtimony of Flacourt, it is produced in ſuch abundance, as to give name to the province; for in thoſe parts it is termed Voulu. The ſize of this tree in India is generally ſo great, that houſes are built of it. In the porch of the Academical Garden at Leyden are ſuſpended ſome fragments, a preſent of the celebrated Piſo, the largeſt of which exceeds twenty-eight, the leaſt twenty-ſix feet in length. That they muſt, however, have been double that ſize before they were broken off, appears probable from this circumſtance, that the thickneſs of one extremity ſcarce differs from that of the other. It is likewiſe wonderful, that ſo immenſe a reed ſhould be clothed with ſo very ſmall leaves; the largeſt of the dried ones in the collection of Profeſſor Syens at Leyden, mentioned by Rheede in his Hortus Malabaricus, ſcarcely exceeding a ſpan in length, or the breadth of a finger in width. The ſtalks, when old, are entirely covered in the cavity with a ſort of calx, which is eſteemed uſeful in the ſtrangury, and to ſuch as are troubled with purulent urine. Bamboo, being burnt, affords very fertile aſhes, in which plants of all kinds thrive remarkably. Whilſt burning, the ſtalks emit a very loud exploſion; the air contained in their cavity being rarified by the heat, and deſiring a larger ſpace, breaks through the partitions at the joints, and violently ſeeks a paſſage whereby to eſcape. Kæmpfer relates, in the Amœnitates Exoticæ, that in a province of Japan, called Oomi, which has a ſlimy bottom, the roots of bamboo luxuriate with ſuch wonderful beauty, that, being dug out of the ground, and diſentangled from the ſtrings which encompaſs them, they ſerve, as the ſtalks with us, for walking ſticks, commonly called Rotang. From this curious reed ſeveral conveniences are obtained, beſides thoſe which have been mentioned. In particular, the natives of India, of the ſtems of the Bamboo, make moſt of their common utenſils. The reader is referred for a more minute detail, to the Mantiſſa Aromatica of Piſo, where, beſides a very accurate deſcription of the Tabaxir

or Sugar, mentioned above, he will alſo learn, that the tender branches or twigs, particularly thoſe near the root, being macerated in ſalt and vinegar, afford, with the addition of garlick, and the pods of capſicum, a ſort of pickle, which is eſteemed excellent, and conſtitutes not the leaſt valuable part of thoſe famous *condita*, commonly termed Achar, and Atsjaar, and well known in Europe for exciting the appetite, and promoting digeſtion.

Mr. Ray, in his "Wiſdom of God in the Creation," juſtly obſerves, that it is no ſmall inſtance of the great Creator's goodneſs, that wheat, and the moſt common corn uſed for food, ſhould be the growth of moſt parts of Europe and Aſia. It is likewiſe no leſs worthy obſervation, that, where the ſoil under the Torrid Zone is too hot to produce wheat, the ſame divine wiſdom hath appointed other kinds of corn to grow and ripen there in great plenty. Thus, in Africa and the Weſt Indies, this want is ſupplied by Indian and Guinea corn: and, in ſome places, where the exceſſive heat of the climate renders labour and the cultivation of corn painful, there bountiful Providence, with an unſparing hand, ordains food without labour, by cauſing banana and plantain trees to grow in great plenty, whoſe fruit is, by many perſons, preferred to any kind of bread whatſoever.

The ſtalk and panicle of Job's tears much reſemble thoſe of Guinea corn; and the ſeeds, which are incloſed in ſmall capſules, are about the bigneſs of an Engliſh pea, and of different colours. Theſe are ſtrung upon ſilk, and uſed inſtead of bracelets by ſome of the poorer ſort in the Weſt Indies, but eſpecially by the negroes. In a ſcarcity of corn, the poor people in Spain and Portugal grind the ſeeds to flour, of which they make a coarſe ſort of bread.

Rice is greatly eſteemed in moſt of the eaſtern countries, where it is the chief ſupport of the inhabitants. The plant bears a ſtalk about three or four feet high, much ſtronger and thicker than that of wheat or other corn. The leaves are long like the reed, and fleſhy; the flowers blow on the top like barley; but the ſeed which follows is diſpoſed in cluſters, each of which is encloſed in a yellow huſk ending in a ſpiral thread. The ſeed is oblong, or rather oval and

2 white,

white. The plant is cultivated in moiſt or low grounds in Italy, and the ſeed brought dry from Piedmont, Spain, and ſeveral other places.

Rice is the chief commodity and riches of Damietta, in Egypt. Dr. Haſſelquiſt thus deſcribes the manner in which they dreſs it, and decorticate, that is, ſeparate it from the huſk. It is pounded by hollow iron peſtles of a cylindric form, an inch in diameter, lifted up by a wheel worked by oxen. A perſon ſitting between the two peſtles puſhes forward the rice, when the peſtles are riſing; another ſifts, winnows, and lays it under the peſtles. In this manner they continue working it, until it is entirely free from chaff and huſks. When clean, they add a thirtieth part of ſalt, and pound them together; by which the rice, formerly grey, becomes white. After this fining, it is paſſed through a fine ſieve, to part the ſalt from the rice; and then it is ready for ſale. Damietta ſells every year ſixty thouſand ſacks of rice, the greateſt part of which goes to Turky, ſome to Leghorn, Marſeilles and Venice.

Guinea corn is the *milium arundinaceum* of Caſpar Bauhin, the *holcus ſorghum* of Linnæus. The ſtalks are large and compact, and full eight feet high. In Senegal the fields are entirely covered with it. The Negroes, who call it *guiarnot*, cover the ears when ripe with its own leaves, to ſhelter it from the ſparrows, which are very miſchievous in that country. The grain made into bread, or otherwiſe uſed, is eſteemed very wholeſome. It is with this that the ſlaves in the Weſt Indies are generally fed, each being allowed from a pint to a quart every day. The juice of the ſtalks is ſo agreeably luſcious, that, if prepared as the ſugar-canes, they would afford an excellent ſugar.

The Negroes on the coaſt of Guinea, make of two ſorts of millet, a thick grained pap, called *couſcous*, which is their common food.

The ſugar-cane grows naturally in both Indies, where it is likewiſe cultivated for its juice, which, when boiled, affords that ſweet ſubſtance called ſugar.

In the manner of their growth, form of their leaves, and make

make of their panicle, the ſugar-canes reſemble the reeds which grow in wet marſhy grounds in England, or elſewhere, except that the canes are far larger, and, inſtead of being hollow, as the reeds, are filled with a white pith, containing the ſweet juice or liquid which ſtamps ſuch an amazing value upon theſe plants. The intermediate diſtance between the joints of a cane is of different lengths, according to the nature of the ſoil, richneſs of the manure, and temperature of the weather during its growth; it ſeldom exceeds, however, four inches in length, and an inch in diameter. The length of the whole cane likewiſe depends upon the above circumſtances. It generally grows to perfection in about fourteen months, when its height, at a medium, is about ſix feet, ſometimes more, ſometimes leſs. The body of the cane is ſtrong, but brittle; of a fine ſtraw-colour inclining to a yellow. The extremity of each is covered, for a conſiderable length, with many long graſſy leaves or blades, ſharply and finely ſawed on their edges; the middle longitudinal rib being high and prominent.

The bottom part of the ſugar-cane top, is about the thickneſs of one's finger; and as it contains a good deal of the natural ſweetneſs of the plant, it is uſually cut into pieces of an inch and a half long, and given to the ſaddle-horſes in the Weſt Indies. It is very nouriſhing food, and fattens them apace. The mill-horſes, mules, and aſſes, are likewiſe fed, during crop-time, on ſugar-cane tops, and the ſkimming of the ſugar-coppers; which laſt muſt be adminiſtered ſparingly at firſt, for fear of griping, and, perhaps, killing them.

The canes, when ripe, are ſqueezed between the iron-caſed rollers of wind-mills, or cattle-mills. The juice thus preſſed out is boiled firſt in a very large copper or cauldron, being mixed with a very ſmall quantity of lime. In default of lime, a ſtrong ley of aſhes will anſwer the ſame purpoſe, and was indeed originally uſed, though the firſt is generally thought to have greater efficacy. The benefits ariſing from either ſubſtance are probably to be attributed, in a great meaſure, to their alkaline qualities.

The

The ſugar-cane, when ripe, is of all plants the ſweeteſt; there is, however, a latent acid ſtill lurking in the juice; as is manifeſt, by its turning ſour, if ſuffered to remain unboiled any conſiderable time after expreſſion. The addition, therefore, of white lime, which the planters call *temper*, is neceſſary to deſtroy, in a great meaſure, the remaining acid, and to form a neutral ſalt.

Lime, or the ſtrong ley juſt mentioned, likewiſe ſerves to carry off all impurities from the liquor. When the quantity of *temper* is duly proportioned, if the liquor is put into a glaſs, an immediate ſeparation will follow; the ſordes ſettle at the bottom, the juice remains tranſparent at top. On the other hand, if there is a deficiency of *temper*, the ſeparation will be imperfect; and if there is a ſuperfluity, there will be no ſeparation at all.

After the lime is mixed with the juice in the copper or cauldron, the impurities in queſtion being no longer intimately united with the boiling liquor, and being forced about with the heat of the fire, are eaſily entangled in a viſcous tough ſubſtance, naturally in the cane-juice, with which they riſe to the top of the copper, forming a thick tough ſcum.

The clarification of the liquor, as far as is done in the firſt copper, is perfected after the more groſs ſcum is taken off; the remaining impurity, as the liquor boils, is ſkimmed off from the four or five remaining coppers, into which the liquor is ſucceſſively poured; each of the coppers being gradually leſs, as containing a leſs quantity of liquor.

In its paſſage to the fourth copper, the liquor is ſtrained through a thick woollen cloth, where it leaves all the remaining impurities that had eſcaped the ſcummer.

After this a light white ſcum is taken off; and, when this ceaſes to ariſe in any conſiderable quantity, and the liquor, by long boiling, becomes more of a ſyrup than a thin liquid, it is then poured into the firſt tache, and from this to a leſſer, till it is conveyed to the laſt. When it has here attained the due conſiſtence neceſſary to become ſugar, it may be aſſerted, ſays Hughes, from whom this account is chiefly

chiefly extracted, that no more than a feventh part of the whole remains; which diminution is occafioned by the impurities being fcummed off, and the watery particles evaporated.

From this laft ftage it is conveyed, whilft of the confiftency of a thick granulated fyrup, into a large brafs cooler, where it fhoots into cryftals, which are the genuine and effential falts of the plant; thefe are forwarded by gently ftirring the whole mafs, by which means the air is admitted to every part, and the particles of fugar difengage themfelves from the clammy fubftance, which is termed melaffes.

When it has grained or cryftallized, it is removed from the cooler into pots or moulds, which are earthen, and of a pyramidal form, containing from eight to thirteen gallons.

About twenty-four hours after the fugar is potted, the fmall round hole in the bottom of each pot is unftopped, and the pots put upon earthen jars, containing about four gallons each. Into thefe veffels, the melaffes drain from the fugar, which, in this degree of perfection, is called mufcavado, and is fit for exportation in a month or fooner.

From the abovementioned fkimmings, mixed with a quantity of water and melaffes, and fermented, is extracted that fpiritous liquor called rum; and from the great quantity of oil in the cane-juice, which is tranfmitted in abundance to the rum, proceeds the excellency of that fpirit compared with brandy. The latter wanting this oilinefs, ftimulates and lacerates the coats of the ftomach; whereas the former, if meliorated by age, and drunk moderately, ferves, by its oilinefs, to lubricate and preferve the bowels.

The moft natural, and perhaps the only proper method of producing canes, is by fuckers, or with the tender tops of old canes. Thefe being cut into pieces of about a foot long, planted in holes of about fix inches deep, and two feet wide, and covered with good manure, will produce each from its roots a great number of canes.

GRAMINIBUS *affines*, the name of a clafs in Haller's natural method, confifting of plants, which, like rufh, carex,

carex, and cyperus, ſeem nearly allied to the family of the graſſes.

GRAMINIFOLIÆ, from *gramen*, graſs, and *folium*, a leaf; the name of a claſs in Ray's *Methodus Propria*, conſiſting of plants which have leaves like thoſe of the graſſes. It is exemplified in ſcirpus and cyperus.

GRUINALES, from *grus*, a crane; the name of the fourteenth order in Linnæus's Fragments of a Natural Method, conſiſting of geranium, vulgarly called crane's bill, and a few other genera, which the author conſiders as allied to it in their habit and external ſtructure.

The title was probably derived from a genus of Rivinus of the ſame name, which Linnæus has added to the genus geranium.

Liſt of the Genera *contained in this Order.*

Linnæan Genera.			*Engliſh Names.*
Aldrovanda.			
Averrhoa.			
Droſera,	—	—	Sundew.
Fagonia.			
Geranium,	—	—	Crane's bill.
Guaiacum,	—	—	Lignum vitæ, or pockwood.
Linum,	—	—	Flax.
Oxalis,	—	—	Wood-ſorrel.
Quaſſia.			
Tribulus,	—	—	Caltrops.
Zygophyllum,	—	—	Bean-caper.

Habit and Structure of the Plants of this Order.

This order furniſhes both herbaceous and woody plants.

The ROOTS are ſometimes fibrous, ſometimes tuberous. In ſome ſpecies of wood-ſorrel they are jointed.

The STEMS are cylindric. The young branches, in ſome, nearly ſquare.

 The

The BUDS are of a conic form, and covered with ſcales.

The LEAVES are either ſimple, as in geranium; or compound, as in lignum vitæ and caltrops. In bean caper, they conſiſt of one pair of *pinnæ* or wings only; in lignum vitæ, from two to five pair; and in caltrops, from three to eight, placed oppoſite. In *fagonia* the leaves are finger-ſhaped, each leaf being compoſed of three lobes or leſſer leaves.

The lower leaves of moſt of the geraniums are commonly alternate; the upper ones are oppoſite, one of the two being larger than the other.

The STIPULÆ or ſcales in the European geraniums ſurround the footſtalks of the lower leaves, and fall with them. In the African ſpecies, all the leaves, both upper and lower, have ſupports of the ſame kind, which are ſometimes united at the baſe, ſo as to have the appearance of a ſingle ſtipula. The ſcales which accompany the leaves at the top of the branches of the European geraniums, fall off very early. Wood-ſorrel bears *ſtipulæ* on its footſtalk, preciſely at the joints.

The FLOWERS are hermaphrodite.

They proceed from the wings of the leaves, either ſingly, as in guaiacum, flax, aldrovanda, and fagonia; or in cluſters, as in ſome ſpecies of geranium and wood-ſorrel.

In ſundew they terminate the branches in a ſpike: and in bean caper, they are produced either ſingly, or two by two, along the branches, without the angles or wings of the leaves.

The CALYX or FLOWER-CUP conſiſts either of five diſtinct leaves, as in moſt of the geraniums, flax, and bean-caper; or of one leaf divided almoſt to the bottom into five parts, as in aldrovanda and ſundew; it generally accompanies the ſeed-bud to its maturity. In fagonia, the calyx, which is compoſed of five leaves, falls with the petals, and the other parts of the flower.

The PETALS are five in number, ſpread, and are frequently funnel-ſhaped. In the different ſpecies of geranium,

the figure of the petals is different, as is likewife their number. In aldrovanda, the petals, as well as the calyx, are permanent.

The NECTARIUM in bean-caper and quaffia, confifts of a number of fmall leaves or fcales, which are inferted into the infide of the bafe of the filaments, and furround the feed-bud. Thefe fcales, in the former, are ten in number, one for each filament: in the latter, they are hairy, and but five in number.

The STAMINA are generally ten in number, awl-fhaped, erect, and of the length of the petals. In averrhoa and geranium they are alternately long and fhort. The filaments in fome of the geraniums are united below; in others, diftinct.

In flax, aldrovanda, and fun-dew, there are but five ftamina; the firft, however, befides its five perfect ftamina, has five other bodies refembling ftamina without tops, which are placed alternate with the former. Nay, in a particular fpecies, called *linum lufitanicum*, there are ten perfect ftamina.

The ANTHERS or tops of the ftamina are generally oblong, and frequently attached to the filaments by the middle, fo as to lie and fometimes to veer about upon them. In flax, the anthers are arrow-fhaped. Their number is not conftant in the different fpecies of geranium: fome have ten, fome feven, and others five.

The SEED-BUD is either oblong, or five cornered.

The number of *ftyles* is either one, as in bean-caper, quaffia, and fagonia; or five, as in aldrovanda, wood-forrel, and flax. In *tribulus* the ftyle is wanting.

The SEED-VESSEL is generally a five-cornered *capfule*, with one, three, five, or ten cells. In *averrhoa*, the feed-veffel is of the apple-kind, fhaped like a top, with five angles, and the fame number of cells. *Quaffia* and *tribulus* have five different fruits or feed-veffels, which, in the former, are egg-fhaped, and inferted into a large round flefhy receptacle. In a fpecies of *tribulus*, the *ciftoides* of Tournefort, the number of fruits is ten.

The

The SEEDS are generally equal in number to the internal divifions or cells of the feed veffel; one feed being placed in each cell. In geranium, the feeds, which are five in number, and kidney-fhaped, are commonly wrapped in the proper coat or covering, called by Linnæus, *arillus*, and terminated by a fpiral beard or haulm. In wood-forrel, the feeds are difperfed with an elaftic fpring.

Flax, with refpect to its virtues and ufes in medicine, is bitter, mucilaginous, purgative, and ufed in inflammations.

Geranium is vulnerary and aftringent.

The leaves of wood-forrel, boiled in broth, are faid to be ferviceable in putrid fevers.

The leaves of *geranium zonale* are marked with a purple circle like a horfe-fhoe, which reaches from one fide of the bafe to the other, and correfponds with the border of the leaf. When gently rubbed, they have a fcent like fcalded apples.

The flowers of *geranium trifte* are marked with dark purple fpots, and fmell very fweet after the fun has left them; hence the fpecies is known among gardeners by the name of night-fcented crane's-bill. In general, it may be obferved, that moft fpecies of geranium with tuberous flefhy roots have their odour augmented in the evening, and during the abfence of the fun.

Guaiacum, or holy-wood, grows plentifully both in the Eaft and Weft Indies, and is brought to us in large long billets or logs, fome of which weigh four or five hundred weight. It is about the fize of a common walnut-tree, bearing bark which is thick and gummy, and eafily parts from the wood. The leaves are winged, and the lobes placed oppofite. The flowers, which confift of five petals, are of a beautiful violet colour. They are fucceeded by a fruit like fmall chefnuts, round, folid, and brown; within which is contained another little fruit or nut, of an orange colour. The wood is hard, firm, weighty, and marbled with brown, red, and black: it is of an acrid tafte. Guaiacum is the beft fort of wood for turnery-ware, efpecially for making mortars, peftles, rowling-pins, and bowls for the

bowling-

bowling-green. In medicine, the ſhavings or raſpings have been long uſed in ptiſans and ſudorific drinks for the venereal diſeaſe. The bark and gum of this tree have likewiſe been uſed with ſucceſs in the cure of the ſame diſorder, as well as in catarrhs, gouts, rheumatiſms, and other diſeaſes proceeding from weakneſs or obſtructions of the viſcera.

From the ſeeds of common flax is expreſſed an oil, which is uſed both by phyſicians and painters; from the bark or peeling of the ſtalks is made linen; and from the rags of linen is made paper; ſo that this plant is one of the moſt valuable in the whole vegetable kingdom.

Caltrops, the tribulus of Virgil *, bears a fruit that is armed with ſtrong prickles. Theſe are apt to run into the feet of the cattle which walk over the ground where they are produced. It has derived both its ſcientific and Engliſh names from the form of the fruit, which reſembles thoſe inſtruments of war that were caſt in the enemies way to annoy their horſe. A ſimilar inſtrument, and with three iron ſpikes, (which exactly correſponds to the Greek Τριβολος, *tres jactus, aut tria jacula,*) has been uſed in hunting the wolf. The military caltrop has commonly four ſpikes, one of which is always erect, the other three adhering to the ground.

GYMNODISPERMÆ, (from γυμνος, naked; δις, twice; and σπερμα, a ſeed;) the name of a diviſion in Hermannus and Boerhaave's Methods, conſiſting of plants which have two ſeeds that are naked, that is, want the pericarpium or ſeed-veſſel. Of this kind are all the umbelliferous tribe of plants, ſuch as angelica, parſly, hemlock, &c. *Vide* UMBELLATÆ.

GYMNOMONOSPERMÆ, (from γυμνος, naked; μονος, alone, ſingle; and σπερμα, a ſeed). The name of a diviſion in Hermannus and Boerhaave's Methods, conſiſting of plants which have flowers with one naked ſeed. Such are all the compound flowers; each floret, or partial flower,

* ——— *ſubit aſpera ſylva*
Lappæque TRIBULIQUE.——— Georg. Lib. I. v. 152.

having

having a ſingle ſeed without a covering or veſſel placed under it. *Vide* SYNGENESIA & COMPOSITUS *flos.*

In Ray's *Methodus propria,* is a diviſion or claſs of the ſame name.

GYMNOPOLYSPERMÆ, (from γυμνος, naked; πολυς, many; and σπεϱμα, a ſeed). The name of a diviſion or claſs in Hermannus and Boerhaave's methods, conſiſting of plants which have many ſeeds that are naked, that is, without any *pericarpium* or ſeed-veſſel. The term is exemplified in anemone, adonis, meadow-rue, virgin's bower and ranunculus.

GYMNOSPERMÆ, (from γυμνος, naked; and σπεϱμα, a ſeed). The name of a principal diviſion in Hermannus's Method, conſiſting of plants whoſe ſeeds are naked, that is, want a covering or ſeed-veſſel, oppoſed to *angioſpermæ,* which ſee.

GYMNOSPERMIA, is the name of an order, or ſecondary diviſion, in the claſs *didynamia* of Linnæus, conſiſting of plants which have four ſtamina two long and two ſhort, and four naked ſeeds. This order correſponds to the labiati, or lipped-flowers, of Tournefort, and the verticillatæ, or plants that flower at the joints, of Ray, and of Linnæus in his Fragments of a Natural Method.

GYMNOTETRASPERMÆ, (from γυμνος, naked; τεσσαϱες, four; and σπεϱμα, a ſeed). The name of a diviſion in Hermannus and Boerhaave's methods, conſiſting of plants which have four naked ſeeds. Of this kind are the rough-leaved plants, as borage, bugloſs, comfrey and lungwort; and the plants which flower at the joints, as mint, marjoram, thyme and dead-nettle. *Vide* ASPERIFOLIÆ & VERTICILATÆ.

GYNANDRIA, (from γυνη, a woman; and ανηϱ, a man or huſband). The name of the twentieth claſs in Linnæus's Sexual Syſtem, conſiſting of plants with hermaphrodite flowers, in which the ſtamina are placed upon the ſtyle, or, to ſpeak more properly, upon a pillar-ſhaped receptacle reſembling a ſtyle, which riſes in the middle of the flower, and

bears

bears both the ſtamina and pointal; that is, both the ſuppoſed organs of generation.

The orders in this claſs are ſeven, founded each upon the number of the ſtamina in the plants which compoſe it. The firſt order conſiſts of plants which have two ſtamina, ſituated as expreſſed in the claſſic character. Such are orchis, baſtard hellebore, bee-flower, ſatyrium, limodorum, arethuſa, lady's ſlipper and vanelloe. Theſe plants, which have a particular ſtructure, conſtitute a true natural order in Linnæus's Fragments, under the name of *orchideæ*. The genera, which were formerly diſtinguiſhed by the root, Linnæus diſcriminates by the nectarium, which is different in each genus.

The ſecond order conſiſts of plants with three ſtamina; it contains two genera, *viz.* ſiſyrinchium, or bermudiana, and ferraria. The third o der has four ſtamina, and contains only one genus, *viz.* nepenthes. The fourth order has five ſtamina, and contains two genera, ayenia and paſſion-flower. The fifth order has ſix ſtamina, and contains two genera, birthwort and piſtia. The ſixth has ten ſtamina, and contains likewiſe two genera, *viz.* kleinhovia and ſcrew-tree. The laſt order contains plants which have an indefinite number of ſtamina. The genera in this order are grevia, cuckow-pint, dragons, African arum, pothos, and graſs-wrack.

The flowers of this claſs, ſays Linnæus, have a monſtrous appearance, ariſing, as he imagines, from the ſingular and unuſual ſituation of the parts of fructification.

H.

HABITUALIS *character*. The character of plants drawn from their port or habit. *Vide* CHARACTERES.

HABITUS *plantæ*. By the ancient botaniſts, the habit of a plant was meant to expreſs its port and general appearance: by Linnæus, habit is defined to be the agreement of plants of the ſame genus or natural order, in the following circumſtances; the number of ſeminal leaves, (plancentatio); the

the nature and form of the root, (radicatio); the ſituation of the leaves and branches, (ramificatio); the twiſting of any of the parts towards one ſide, as of the ſtem and corolla, (intorſio); the origin or conſtruction of the buds, (gemmatio); the complication or folded ſtate of the leaves within the buds, (vernatio); the ſituation and ſtructure of the ſtipulæ or ſcales, which are placed at the baſe of the young foot-ſtalks of the leaves and flowers, (ſtipulatio); the nature of their armature or offenſive weapons and veſſels of ſecretion, (pubeſcentia & glandulatio); their juices, (lacteſcentia); and the manner in which the flowers are borne, or ſupported on their footſtalks, (infloreſcentia). *Vide* PLACENTATIO, &c.

HAMUS, a hook; a ſpecies of briſtly armour, in which each briſtle is bowed inwards at the top. Of this kind are the offenſive weapons of burdock and Guinea-hen weed. In lappula, the hooks are three-pointed.

HEDERACEÆ, (from hedera, ivy). The name of the forty-ſixth order in Linnæus's Fragments of a Natural Method, conſiſting of ivy, and a few other genera, which, from their general habit and appearance, ſeem nearly allied to it.

Liſt of the Genera *contained in this Order.*

Linnæan Genera,		*Engliſh Names.*
Aralia,	— —	Berry-bearing angelica.
Ciſſus,	— —	Wild grape.
Hedera,	— —	Ivy.
Panax,	— —	Ginſeng.
Vitis,	— —	Vine.
Zanthoxylum,	— —	Tooth-ach tree.

Habit and Structure of the Plants of this Order.

This order furniſhes both herbaceous and ſhrubby plants, moſt of which, particularly ivy and vine, have creeping branches, that attach themſelves by roots or tendrils to the bodies in their neighbourhood.

Th

The ROOTS are long, with few branches.

The STEMS and YOUNG BRANCHES are cylindric. In ſome ſpecies of vine they are ſquare.

The LEAVES are alternate, ſometimes ſimple, as in ivy and vine, ſometimes winged, as in tooth-ach tree, in which the ſurface of the leaves is covered with points.

The foot-ſtalk of the leaves is cylindrical, and without any furrow.

The BUDS are of a conic form, and without ſcales.

On each ſide of the foot ſtalk of the leaves of the vine, are placed two pretty large STIPULÆ or ſcales. Along the branches of tooth-ach tree are protruded from the bark, a number of prickles which fall off very early.

From the ſide oppoſite to the leaves in the vine, proceeds a branching tendril, which ſerves to faſten the plant in queſtion to the bodies in its neighbourhood, for the purpoſe of ſupport.

The FLOWERS are either hermaphrodite, as in ivy, vine, berry-bearing angelica, and ciſſus; male and female upon different roots, as in ginſeng; or hermaphrodite and male upon different roots, as in tooth-ach tree.

They terminate the branches in an umbel or looſe ſpike in ginſeng, berry-bearing angelica and ivy; and proceed in cluſters from the ſide oppoſite to the leaves in the vine and ciſſus. In tooth-ach tree they are produced along the branches.

The CALYX, or proper flower-cup, conſiſts of one leaf divided into five parts, which are ſmall and generally permanent. In ciſſus, ivy, tooth-ach tree, and berry-bearing angelica, there is an *involucrum* or cover conſiſting of many leaves which are permanent, placed under each umbel or cluſter of flowers, In ginſeng and aralia, the calyx is placed above the ſeed-bud.

The PETALS, in this order, are generally five in number; ciſſus has four petals, tooth-ach tree none.

The STAMINA are in number five, awl-ſhaped, erect, and generally of the length of the petals. Ciſſus has only four ſtamina, which are inſerted into the nectarium, a ſort of border ſurrounding the ſeed-bud,

The

The ANTHERS, or tops of the ſtamina, are roundiſh, and ſometimes, as in ivy, attached to the filaments by the ſides. In tooth-ach tree, the filaments are crowned with twin antners; that is, each filament is furniſhed with two tops.

The SEED-BUD is ſometimes round, ſometimes ſhaped like a top or pear, and ends in one, two or five awl-ſhaped ſtyles, which are crowned with a ſimple *ſtigma* or ſummit. The flowers of the vine have no ſtyle.

The SEED-VESSEL is of the berry kind; with one cell, as in ciſſus, ivy and vine; two, as in ginſeng; or five, as in aralia. In tooth-ach tree, the ſeed-veſſel is a capſule with one cell, and two external openings or valves. Aralia has its berry crowned with the remains of the calyx, which was placed above the ſeed-bud.

The SEEDS are from one to five in number, placed either in diſtinct cells, as in aralia; or diſperſed through the pulp without any partition, as in ivy berries and the grapes of the vine.

The roots of ginſeng, the *panax quinquefolium* of Linnæus, although very hot, are eſculent. The Chineſe hold the whole plant in great eſtimation, and affirm it to be a ſovereign remedy for all weakneſſes occaſioned by exceſſive fatigue, whether of body or of mind. The root, which in ſhape greatly reſembles that of the mandrake, becomes yellowiſh in drying; and, when chewed, diffuſes an agreeable warmth over the whole body. In ſhort, it is a kind of panacea or univerſal medicine in China, where it is ſaid to be valued at three times its weight in ſilver.

If the account given by Kolben, in his State of the Cape of Good Hope, be accurate, ginſeng, which is known to be a production of China, Japan, Canada, Penſylvania, Virginia, and Carolina, all ſituated to the north of the equator, grows likewiſe naturally and in the ſame latitude with ſome of the countries juſt mentioned, in the ſouthern hemiſphere. "There is a root," writes this amuſing Traveller, "gathered in the Hottentot countries called *Kanna*, in ſuch eſteem among theſe people for its virtues, that they almoſt adore it. What much enhances the value of this root is its ſcarcity, being

being very rarely to be found. They regard it as the noblest restorative in the world, will give almost any thing for it in exchange; and in short, for the smallest piece of *Kanna*, will perform a hard day's work, run twenty miles upon an errand, nor think any labour a sufficient compensation for so gratifying a present. I have often," he proceeds, "observed the effects of Kanna upon Hottentots. They chew and retain it a considerable time in their mouths; but taking generally too much at a time, it drowns them in intoxications. They chew it not long before their spirits visibly rise, their eyes brighten, their faces assume a jovial air, and they sport and wanton under a thousand gaieties of imagination; but in the end, it divests them entirely of their senses, and they are th own into the wildest delirium, and most fantastical extravagancies."

The reader, who would acquire farther notices of this curious plant, is referred to Kalm's Travels into North America, Vol. III. Osbeck's Voyage to China and the East Indies, Vol. I. p. 223, of Forster's Translation. Catesby's Natural History of Carolina, Vol. III. Gronovius's *Flora Virginica*; and Father Charlevoix's History of Canada or New France.

Wild grapes grow naturally in the West Indies, where they are frequently eaten by the Negroes, but are chiefly food for birds and wild fowl.

Ivy is highly astringent; the leaves are frequently applied with success to issues and inflammations of the skin. A dose of the full ripe berries has been recommended as a remedy against the plague. The gum of ivy is a powerful resolvent and discutient, and an excellent ingredient in plaisters and ointments for such purposes.

Caspar Bauhin and Tournefort mention a sort of ivy that grows in many of the islands of the Archipelago, to which they have given the name of poet's ivy, because the ancients are said to have made crowns of this plant for adorning the brows of their poets. By others it is called hedera dionysias, because they made use of the same sort of ivy in their public rejoicings and feasts in honour of Bacchus. The berries

are

are of a fine gold colour; whence the ſpecies in queſtion has been termed by others, chryſocarpos.

Tooth-ach tree, ſometimes called pellitory-tree, is ſudorific and diuretic, and is frequently employed in Canada, to promote theſe ſecretions.—The bark is preſcribed for the tooth-ach, from whence it derives its name.

HEPTANDRIA, (from ἑπτα, ſeven; and ἀνηρ, a man, or huſband). The ſeventh claſs in Linnæus's Sexual Method, conſiſting of plants with hermaphrodite flowers which have ſeven ſtamina or male organs. The orders are four, derived from the number of ſtyles or female organs. Horſe-cheſnut and trientalis have one ſtyle; limeum has two; lizard's tail three; and ſeptas ſeven.

HERBA, the herb. By this name Linnæus, in his diſtribution of the parts of a plant, denominates that portion of every vegetable which ariſes from the root, and is terminated by the fructification. It comprehends—I. The trunk, ſtalk, or ſtem.—II. The leaves.—III. Thoſe minute external parts called by Linnæus the *fulcra* or ſupports of plants.—IV. The buds; or, as they are termed by the ſame author, the winter-quarters of the future vegetable.

HERBACEA *planta*, an herbaceous vegetable; a plant with a ſucculent ſtem or ſtalk, which dies down to the root every year. Of herbaceous plants, thoſe are annual, which periſh, ſtem, root, and all, at the end of one year; biennial, which ſubſiſt two years by their roots; perennial, which are perpetuated by their roots for a ſeries of years, a new ſtem being produced every ſpring.

HERMAPHRODITA *planta*. An hermaphrodite plant; that is, a plant producing hermaphrodite flowers only. *Vide infra.*

HERMAPHRODITUS *flor*; (from 'Ερμης, Mercurius, and 'Αφροδιτη, Venus,) a flower ſo termed by the Sexualiſts, which contains both the *anthers* and *ſtigma* the ſuppoſed organs of generation, within the ſame calyx and petals. Of this kind are the flowers of all the claſſes in Linnæus's Sexual Method, except the claſſes *monœcia* and *diœcia*: in the former of which, male and female flowers are produced

on

on the ſame root; in the latter, on diſtinct plants from the ſame ſeed. In the claſs *polygamia*, there are always hermaphrodite flowers mixed with male or female, or both, either on the ſame or diſtinct roots.

In the plantain-tree, the flowers are all hermaphrodite; in ſome, however, the *anthers*, or male organ, in others, the *ſtigma*, or female organ, proves abortive. The flowers, in the former caſe, are ſtiled female hermaphrodites; in the latter, male hermaphrodites.

Hermaphrodites are as frequent in the vegetable, as they are rare and unuſual in the animal, kingdom.

HESPERIDEÆ (from the Heſperides, whoſe orchards, according to the Poets, produced golden apples). Golden or precious fruit. The name of the nineteenth order in Linnæus's Fragments of a Natural Method, conſiſting of the five following genera.

Linnæan Genera.		*Engliſh Names.*
Caryophyllus,	— —	Clove-tree.
Eugenia.		
Myrtus,	— —	Myrtle, all-ſpice or pimento.
Philadelphus,	— —	Mock orange or ſyringa.
Pſidium,	— —	Guayava or bay-plumb.

Habit and Structure of the Plants of this Order.

The plants of this order are of the ſhrub and tree kind, and moſtly ever-green.

The bark of the ſtalks is ſlender, and comes off in thin plates.

The LEAVES are generally oppoſite, and covered with ſmall tranſparent points. In ſome genera, particularly the myrtle and guayava, the leaves are placed oppoſite at the bottom of the ſtalks, and alternate above.

The BUDS are of a conic form. In the mock orange, they are almoſt ſpherical, and covered with ſcales, or rather with leaves, which by their minuteneſs reſembles ſcales. They are concealed in the cavity which is formed by the foot-ſtalk

foot-ſtalk of each leaf at its origin.—In the myrtle and guayava are obſerved two ſmall points in the form of *ſtipulæ* or ſcales.

The FLOWERS are generally hermaphrodite. In a ſpecies of myrtle, they are male and female upon different roots.

They proceed from the wings of the leaves, either ſingly, or in cluſters like ivy-berries.

The CALYX is placed above the ſeed-bud, and accompanies it to its maturity.

The PETALS are three, four, or five in number, and ſtand upon the brims of the tube of the calyx.

The STAMINA are upwards of twenty, nearly equal, and attached in ſeveral rows to the middle of the tube of the calyx.

The SEED-BUD is large, oblong, and placed below the receptacle of the flower. The *ſtyle* is ſingle, awl-ſhaped, of the length of the ſtamina, and terminated with a ſingle *ſtigma* or ſummit.

The SEED-VESSEL in guayava and myrtle, is a berry, furniſhed with one cell in the former, with three in the latter. In mock orange, the ſeed-veſſel is a capſule with four cells; in *eugenia*, it is of the nature of a cherry, and contains a ſtone.

The SEEDS are numerous, ſmall and oblong, in mock orange and guayava. Myrtle-berries have three ſingle kidney-ſhaped ſeeds, one in each cell.

The leaves and fruits of theſe plants are aſtringent. The berries are eſculent. A decoction of the roots of guayava is employed with ſucceſs in dyſenteries: a bath of a decoction of the leaves is ſaid to cure the itch and other cutaneous eruptions.

Guayava or guava is diſtinguiſhed from the colour of the pulp into two ſpecies, the white and the red; and from the figure of the fruit, into the round, and the pear-faſhioned or perfumed guava. The latter has a thicker rind, and a more delicate taſte than the other. Either ſpecies, if carefully cultivated, and in a good ſoil, will grow to about eighteen feet in height. The bark is very ſmooth, and of a reddiſh grey.

grey. The leaves are about three inches long, ſharp-pointed, and have a prominent rib in the middle. The flowers conſiſt of five petals, which are white, and ſurround a great many ſhort ſtamina tipped with pale-yellow tops. The fruit is about the bigneſs of a large tennis-ball; the rind or ſkin generally of a ruſſet ſtained with red; the top is adorned, like the apple and pear, with a crown conſiſting of the remains of the calyx. The pulp within the thick rind is of an agreeable flavour, and interſperſed with a number of ſmall white ſeeds. The rind of the guava, when ſtewed, is eaten with milk, and preferred to any other ſtewed fruit. From the ſame part is made marmalade; and from the whole fruit is prepared the fineſt jelly in the world. The fruit is very aſtringent, and nearly of the ſame quality with the pomegranate; ſo ſhould be avoided by all who are ſubject to be coſtive. The ſeeds are ſo hard as not to be affected by the fermentation in the ſtomachs of animals; ſo that when voided with the fœces, they take root, germinate and produce thriving trees. Whole meadows in the Weſt Indies are covered with guavas, which have been propagated in this manner.—The buds of guava, boiled with barley and liquorice, produce an excellent ptiſan for diarrhœas, and even the bloody-flux, when not too inveterate. The wood of the tree, employed as fuel, makes a lively, ardent, laſting fire.

The leaves and flowers of common upright myrtle have an aſtringent quality; and are uſed for cleanſing the ſkin, contracting the fleſh, and ſtrengthening the fibres. From the flowers and young tops is drawn a diſtilled water that is deterſive, aſtringent, coſmetic, and uſed in gargles. A decoction of the flowers and leaves is applied in fomentations. The berries have a binding deterſive quality, and the chemical oil obtained from them is excellent for the hair, and uſed in pomatums, and moſt other external beautifiers of the face and ſkin. As an internal medicine, theſe berries have little merit: they enter, however, into the compoſition of ſeveral of the ſtrengthening plaiſters.

The common clove, a native of the Molucca iſlands, is the

the unripe fruit of the caryophyllus aromaticus of Tournefort and Linnæus. The ripe fruit, the mother cloves, or antophilli of the ſhops, is ſeldom ſeen. It is a ſecret among ſome who deal largely in cloves, to keep them in a cellar or other damp place, where they will ſwell and encreaſe conſiderably in weight, and look much better, though they are, in effect, much worſe, than before ſuch management. The fable of the other trees bending to the royal clove, mentioned by Pomet and Lemery, is too abſurd to bear any animadverſions. The inhabitants of the iſland of Maſſia in the Eaſt Indies, where the royal clove grows, ſtring the fruit and make beads of it, which they wear about their necks, on account of the fragrancy of the ſmell.

Cloves, before they have attained maturity, are of a delightful colour. Some authors relate, that they are originally poſſeſſed of ſuch an attractive ſpungy quality, as frequently to drain, with facility, any liquids that ſtand near them; ſo that, unleſs the maſter of the ſhip, which conveys them from the iſlands, is very careful to keep them at a convenient diſtance from his liquors, a quantity of them will, in two days time, exhauſt and dry up a hogſhead of wine or water.

Pimento, all-ſpice, or Jamaica pepper, is the dried unripe fruit of the piper odoratum Jamaicenſe of Ray, the myrtus pimento of Linnæus; the bay-berry tree of ſome authors. It is a round fruit, with a duſkiſh, hard, rough, umbilicated rind, containing within it two black kernels, of an aromatic ſmell and taſte approaching to that of cloves, yet partaking, in ſome degree, of the odour and taſte of all the other ſpices, whence it has obtained the name of *all-ſpice*. The tree which produces it, riſes to the height of thirty or forty feet; and in a rich ſoil, will grow even to the height of an hundred feet. The leaves are like thoſe of the bay, but of a much ſtronger aromatic ſmell; the flowers ſtand in bunches, and are of a greeniſh colour; theſe are ſucceeded by the fruit, which the Negroes gather before it is ripe, and dry in the ſun; in drying, it becomes wrinkled and brown, hough formerly ſmooth and green. The tree grows naturally

turally in hilly places, in the north part of Jamaica. At Chriſtmas, they uſually adorn their churches in the Weſt Indies with ſmall boughs of pimento; as the churches in England are decked with holly and ivy at that ſacred ſeaſon.

All-ſpice is an excellent aromatic; it fortifies the heart and ſtomach, diſſipates wind, promotes urine and the catamenia, animates the blood and ſpirits, and removes all manner of obſtructions. Thus it is cordial, cephalic, aperient, ſtomachic and carminative. The oil of pimento, which is procured by diſtillation, ſinks in water like the oil of cloves.

HEXAGYNIA (from ἕξ, ſix; and γύνη, a woman, or wife). The name of an order or ſecondary diviſion in the Linnæan Syſtem, conſiſting of plants which, beſides their claſſic character, have their flowers furniſhed with ſix ſtyles or female organs. It is only to be found in the ninth and thirteenth claſſes of the Sexual Method.

HEXANDRIA (from ἕξ, ſix; and ἀνὴρ, a man, or huſband). The name of the ſixth claſs in Linnæus's Sexual Method, conſiſting of plants with hermaphrodite flowers which are furniſhed with ſix ſtamina or male organs that are of an equal length.

This numerous claſs of plants is divided into five orders or ſections, from the number of the ſtyles or female organs. Narciſſus, ſnow-drop, aloe, yucca, lily, crown imperial, aſphodel, ſpider-wort, flower-of-a-day, tulip, lion's leaf, dog's tooth violet, ſuperb lily, hyacinth, and ſeveral others, have one ſtyle or female organ: rice, velezia and atraphaxis, have two; dock, ſtar-flower, and medeola, three; guinea-hen weed, four; and water-plantain, five.

The claſs *hexandria* is diſtinguiſhed from the claſs *tetradynamia* of the ſame author by the proportion of the ſtamina, which, in the former, are of an equal length, in the latter, unequal; four ſtamina being long, and two ſhort.

HEXAPETALI, (from ἕξ, ſix, and πεταλον, a leaf). The name of two claſſes, or primary diviſions, in Rivinus's Method, conſiſting of plants with ſix petals, which are either of a regular, or irregular form.

HILUM, the external mark or ſcar of a ſeed in the place where it was faſtened within the *pericarpium*. It is conſpicuous in the bean, bladder-nut, and heart-ſeed.

HIRSUTIES. *Vide* PUBESCENTIA.

HOLERACEÆ (from *holus*, pot-herbs). The name of the twelfth order in Linnæus's Fragments of a Natural Method, conſiſting of plants which are uſed for the table, and enter into the œconomy of domeſtic affairs.

Liſt of the Genera *contained in this Order.*

SECTION I.

Hermaphrodite Plants.

Linnæan Genera.		English Names.
Anabaſis,	— —	Berry-bearing glaſs-wort.
Anacardium,	— —	Acajou, or caſhew-nut.
Atraphaxis.		
Baſella,	— —	Malabar night-ſhade.
Beta,	— —	Beet.
Blitum,	— —	Blite, or ſtrawberry ſpinach.
Bucida.		
Calligonum.		
Callitriche,	— —	Star-headed Water-Chickweed.
Camphoroſma.		
Chenopodium,	— —	Gooſe-foot, or wild orach.
Coccoloba.		
Coriſpermum,	— —	Tickſeed.
Heiſteria.		
Herniaria,	— —	Rupture-wort.
Illecebrum,	— —	Mountain knot-graſs, whitlow-graſs.
Laurus,	— —	Bay, cinnamon, camphire, ſaſſafras, Avocato pear-tree, and benjamin-tree.
Mimuſops.		

Linnæan Genera.	English Names.
Petiveria, —	— Guinea-hen weed.
Polycnemum.	
Polygonum, —	— Knot-grafs, biftort.
Rheum, —	— Rhubarb.
Rhizophora, —	— Mangrove, kandel of the Indians.
Rivina.	
Rumex, —	— Dock.
Salicornia, —	— Jointed glafs-wort, or falt-wort.
Salfola, —	— Glafs-wort.
Tinus.	
Winterania.	

SECTION II.

Male, Female, Androgynous and Polygamous Plants.

Atriplex, —	— Orach.
Axyris.	
Begonia.	
Ceratocarpus.	
Nyffa, —	— The tupelo-tree.
Spinacia, —	— Spinach.

Habit and Structure of the Plants of this Order.

This very numerous order of plants contains trees, fhrubs, and perennial and annual herbs; fome of the woody vegetables, as the bay, cafhew-tree, and *atraphaxis*, retain their green leaves during the winter.

The Roots are very long, and frequently fpindle-fhaped; from the knots of the ftems and branches of fuch plants as creep on the ground, or float in the water, proceed fibrous and branched roots.

The Stems and young branches are cylindric. In Malabar night-fhade, they climb and are twifted from left to right, in

in the direction of the apparent diurnal motion of the fun. In the greateft part of the aquatic plants of this order, the ftalks are hollow within. In fome fpecies of *polygonum*, the branches being ftript of their leaves, appear to be terminated in a thorn.

The BUDS are of a conic form, and naked; that is, not accompanied with fcales.

The LEAVES are generally fimple, alternate, entire, and attached to the branches by a cylindric foot-ftalk, which is fometimes very long, as in the tupelo-tree, but generally very fhort.—The leaves of glafswort are fhort, awl-fhaped, flefhy, and terminated with fpines. In jointed glafs-wort, the leaves appear to be nothing elfe than fmall appendages of the articulations or joints of the branches.—In mountain knot-grafs the leaves are placed oppofite; and in *polycnemum*, they are oppofite at the bottom, and alternate at top.—Some plants of this order have two STIPULÆ or fcales attached to the branches, near the origin of the foot-ftalk of each leaf. Thofe of mangrove are very large, furround the extremity of the branches, and envelop the young leaves, which in unfolding, pufh off the *ftipulæ* that are placed above them.

In many plants, as the biftorts, rhubarb, dock, and atraphaxis, inftead of *ftipulæ*, each leaf bears on its foot-ftalk a membranaceous fheath, which is cylindric, frequently fringed on the margin, and penetrated by the ftem. In fome fpecies of polygonum, the vagina or fheath in queftion continues a long time after the fall of the leaves.

The FLOWERS in plants of the firft fection are hermaphrodite: in thofe of the fecond, male and female upon the fame root, as in axyris; male and female upon different roots, as in fpinach; hermaphrodite and male on the fame root, as in begonia; hermaphrodite and female on the fame root, as in orach; hermaphrodite and male on different roots, as in the tupelo-tree.

In tick-feed, and fome fpecies of wild orach, which belong to the firft fection, there are female flowers mixed with the hermaphrodite upon the fame plant.

Many of the hermaphrodite flowers of the cafhew-nut prove barren.

The

The flowers proceed either ſingly, or in greater numbers, from the angles of the leaves; or terminate the branches in ſpikes, umbels, or panicles.

Theſe are the only ſtriking and eſſential characters of this numerous collection of plants: for, as they do not ſo properly conſtitute one natural order, as an aſſemblage of many, a deſcription of the parts of fructification would lead us to a ſeparate diſcuſſion of each genus, which is foreign to the deſign of the preſent work.

The caſhew-nut, or acajou, is a native of both Indies. It is a low, wide-ſpreading tree, and ſeldom exceeds twenty feet in height; the branches are crooked, ſtraggling, and covered with oval leaves reſembling thoſe of the ivy, or Engliſh dwarf-apple. The flowers are ſmall, white, and cut into five ſegments. Theſe are ſucceeded by the fruit, which is generally of a yellow colour, as large as an orange, of a conical form, with the leſſer end towards the ſtalk on which it grows. At the greateſt end, or outſide top of this fruit, ſometimes called the cherry, grows the ſtone commonly ſtiled the nut, quite bare, in the exact ſhape of a ſheep or hare's kidney, about an inch long, containing within it a large white kernel, of a fine taſte, which is roaſted and eaten. The inſide of the fruit or cherry is very ſtringy, and full of rough, aſtringent, but pleaſant juice, which in America is frequently uſed, like that of lemons with us, in making punch. The outer ſhell of the nut is of an aſh-colour, and very ſmooth. Under this outer rind is another which covers the kernel; between them is a thick black inflammable oil, which is very cauſtic.

When the Weſt-India young ladies fancy themſelves too much tanned by the ſcorching rays of the ſun, they gently ſcrape off the thin outſide ſkin of the ſtone, and then rub their face all over with the ſtone. This immediately ſwells and grows black; and the ſkin being thus poiſoned, will, in the ſpace of five or ſix days, come entirely off the face in large flakes, ſo that they cannot appear in public under a full fortnight; by which time the new ſkin looks as fair as that of a young child.

 The

The negroes in Brafil cure themfelves effectually of diforders in the ftomach, by eating of the yellow fruit of the acajou, the juice of which being acid, cuts the thick tough humour which obftructed the free circulation of the blood, and thus removes the complaint. This cure, however, is not voluntary; for their mafters, the Portuguefe, deny them any other fuftenance, and letting them loofe to the woods, where the cafhew-nuts grow in great abundance, leave it in their option to perifh by famine, or fuftain themfelves with what Nature had provided them.—It is this neceffity which leads them to the fruit of the acajou, of which they are not fond; and after continuing the ufe of it for fome days, they return to their mafters perfectly recovered from their indifpofition, and endued with ftrength to perform their cuftomary labour.

The milky juice of the cafhew-tree will ftain linen of a deep black, which cannot be wafhed out again.

From the berries of climbing malabar night-fhade, is drawn a beautiful red colour. The juice of thefe berries is faid to be ufed for ftaining calicoes in India. The ftalks and leaves of the plant are thick, ftrong, and fucculent.

Moft of the fpecies of wild orach have an aromatic fœtid fmell. A fpecies which grows near the coafts of the Mediterranean is ufed by the Egyptians in fallads, on account of its faltifh aromatic tafte, which is agreeable.—From the fame plant kelp is made in other countries.

Mangroves, the mangles of Plumier, are often forty or fifty feet high: they grow only in water, and on the banks of rivers where the tide flows up twice a day. They preferve the verdure of their leaves throughout the year. From the loweft branches iffue long roots, which hang down to the water, and penetrate into the earth. In this pofition they refemble fo many arcades from five to ten feet high, which ferve to fupport the body of the tree, and even to advance it daily into the bed of the water. Thefe arcades are fo clofely intertwifted one with another, that they form a kind of natural and tranfparent terrace, raifed with fuch folidity over the water, that one

might

might walk upon them, were it not that the branches are too much encumbered with leaves. The moſt natural way of propagating theſe trees, is to ſuffer the ſeveral ſlender ſmall filaments which iſſue from the main branches, to take root in the earth. The moſt common method, however, is that of laying the ſmall lower branches in baſkets of mould or earth till they have taken root.

The deſcription juſt given pertains chiefly to a particular ſpecies of mangrove, termed by the Weſt-Indians, black mangles, on account of the brown duſky colour of the wood. The bark is very brown, ſmooth, pliant when green, and generally uſed in the Weſt-India iſlands for tanning leather. Below this bark lies a cuticle, which is lighter, thinner, and more tender. The wood is nearly of the ſame colour as the bark, hard, pliant, and very heavy. It is frequently uſed for fuel, for which purpoſe it is ſaid to be remarkably proper: the fires which are made of this wood being both clearer, more ardent and durable than thoſe made of any other materials whatever.—The wood is compact, almoſt incorruptible, never ſplinters, is eaſily worked, and, were it not for its enormous weight, would be commodiouſly employed in almoſt all kinds of work, as it poſſeſſes every property of good timber.—To the roots and branches of mangroves that are immerſed in the water, oyſters frequently attach themſelves; ſo that wherever this curious plant is found growing on the ſea-ſhore, oyſter-fiſhing is very eaſy; as in ſuch caſes, theſe ſhell-fiſh may be literally ſaid to be gathered upon trees.

The red mangles or mangrove, grows on the ſea-ſhore, and at the mouth of large rivers, but does not advance, like the former, into the water. It generally riſes to the height of twenty or thirty feet, with crooked, knotty branches, which proceed from all parts of the trunk. The bark is ſlender, of a brown colour, and, when young, is ſmooth, and adheres very cloſely to the wood; but when old, appears quite cracked, and is eaſily detached from it. Under this bark is a ſkin as thick as parchment, red, and adhering cloſely to the wood, from which it cannot be detached till the tree

is

is felled and dry. The wood is hard, compact, heavy, of a deep red, with a very fine grain. The pith or heart of the wood being cut into ſmall pieces, and boiled in water, imparts a very beautiful red to the liquid, which communicates the ſame colour to wool and linen. The great weight and hardneſs of the wood prevent it from being generally uſed. From the fruit of this tree, which, when ripe, is of a violet colour, and reſembles ſome grapes in taſte, is prepared an agreeable liquor, much eſteemed by the inhabitants of the Caribbee iſlands.

White mangles, ſo termed from the colour of its wood, grows like the two former, upon the banks of rivers, but is ſeldom found near the ſea. The bark is grey; the wood, as we have ſaid, white, and, when green, ſupple; but dries as ſoon as cut down, and becomes very light and brittle. This ſpecies is generally called rope-mangrove, from the uſe to which the bark is applied by the inhabitants of the Weſt Indies. This bark, which by reaſon of the great abundance of ſap, is eaſily detached, when green, from the wood, is beaten or bruiſed betwixt two ſtones, until the hard and woody part is totally ſeparated from that which is ſoft and tender. This laſt, which is the true cortical ſubſtance, is twiſted into ropes of all ſizes, which are exceedingly ſtrong, and not apt to rot in the water.

The aſhes of the glaſſworts and jointed glaſſworts, are uſed in making of glaſs and ſoap.

True rhubarb is the root of the *rheum palmatum* of Linnæus. The leaves are hand-ſhaped and pointed. The purgative quality of the root is too well known to be enlarged on in this place.

A ſpecies of rhubarb, called by the Arabians, *ribes*, grows naturally on mount Libanus, and other mountainous parts of Syria. The ſurface of the leaves is covered with warts or rough protuberances.—The monks in thoſe parts are ſaid to ſubſiſt principally upon this plant.

The avocato or avigato pear-tree, a native of the Weſt-India iſlands, ſo called from its fruit, which in form and thickneſs reſembles a pear, is the *laurus perſea* of Linnæus.

The

The pulpy or flefhy part of the fruit is of a pale green, with little or no confiftence when ripe, and melts in the mouth like marrow, which it greatly refembles in tafte.—The fkin is fmooth and thin, but of a ftrong tough fubftance, and of a beautiful green colour, which does not become yellow till the fruit is perfectly ripe.—The fruit, by reafon of its foftnefs, may be eaten out of the furrounding fkin with a tea-fpoon, like jelly and marmalade. It is frequently ferved up, in the Weft-Indies, on a plate with fugar, rofe-water, and orange-flowers; moft commonly, however, it is mixed with fugar, and the juice of limes, which render it extremely palatable. The unripe fruit too is frequently plucked, and eaten in thin flices with pepper and falt. In this ftage, the tafte of the avocato greatly refembles that of artichoke. Every preparation of this fruit is efteemed highly nourifhing; as it warms, exhilarates, and fortifies the ftomach.—It is particularly recommended in dyfenteries. In the middle of the pulpy part of the fruit lies the nut or feed, which is very large, almoft round, of a pale ruffet colour, a little wrinkled, contains no kernel within it, and whofe degree of hardnefs does not exceed that of a chefnut diverted of its fkin. This nut, about an hour after it is feparated from the fruit, fplits of itfelf into two or three pieces. If committed to the ground in this ftate, no vegetation enfues, becaufe the embryo of the feed is broken; fo that fuch as would propagate thefe plants from feed muft fow the nuts the moment they are taken out of the pulp; in which cafe they will begin to germinate in eight or ten days after. The bark and wood of this tree, which rifes to a confiderable height, are of a greyifh colour. The leaves are long, pointed, of a fubftance like leather, and of a beautiful green colour. The flowers are produced in large knots or clufters at the extremities of the branches, and confift each of fix petals difpofed in the form of a ftar, and of a dirty-white, or yellow colour, with an agreeable odour, which diffufes itfelf to a confiderable diftance. The tree begins to bear fruit two years and a half, or at moft three years after being planted; and, like moft of the trees in warm climates, bears twice a year.

The

The buds of the avigato pear-tree are ſaid to be uſed with ſucceſs in ptiſans againſt the venereal diſeaſe. An infuſion of them in water, drunk in the morning faſting, is ſtrongly recommended for diſlodging coagulated blood in the ſtomach produced by a fall or a ſevere ſtroke on that important *viſcus*. "The wild boars in the Indies," ſays Labat, "eat greedily of the mammees and avigato pears, which give their fleſh a luſcious and moſt agreeable ſavour."

The wood of the *laurus borbonia*, or red bay of Carolina, is much eſteemed, being of a very fine grain; ſo is frequently made into cabinets, and other ornamental furniture. It dyes a beautiful-black colour.

Camphire-tree, the *Laurus Camphora* of Linnæus, the *Laurus Camphorifera* of Kæmpfer, grows naturally in the woods of the weſtern parts of Japan, as likewiſe in Sumatra, Borneo, and other parts of India. The root ſmells more of camphire than the other parts, and being boiled yields it. The bark of the ſtalk is, outwardly, ſomewhat rough; but in the inner ſurface, ſmooth and mucous, and therefore eaſily ſeparated from the wood, which is dry, and of a white colour. The leaves ſtand upon ſlender footſtalks, have an entire undulated margin, run out into a point, have the upper ſurface of a lively and ſhining green, the lower herbaceous and ſilky, and are furniſhed with a few lateral nerves, which ſtretch archwiſe to the circumference, and frequently terminate in ſmall warts; a circumſtance which may be conſidered as peculiar to this ſpecies of laurel. The flowers are produced on the tops of footſtalks, which proceed from the arm-pits of the leaves, but not till the tree has attained conſiderable age and ſize. The flower-ſtalks are ſlender, branched at the top, and divided into very ſhort pedicles, each ſupporting a ſingle flower. The flowers conſiſt of ſix white petals, and are ſucceeded by a purple ſhining berry, of the ſize of a pea, and in figure ſomewhat top ſhaped. It is compoſed of a ſoft pulpy ſubſtance, that is purple, and has the taſte of cloves and camphire, and of a *nucleus* or kernel, of the ſize of a pepper, that is covered with a black, ſhining, oily corticle, of an inſipid taſte.

Camphire-

Camphire-tree is known in Japan by the ſeveral names of Sſio, Kus-no-ki and Nambok. The ſubſtance termed camphire is procured by diſtilling the roots and branches of the tree in an alembic having a head made of twiſted and plaited ſtraw. All the humidity evaporates through the head, and the camphire ſticks to it. In this ſtate it is of a greyiſh colour; but, after being refined by ſublimation in a ſand-heat, it becomes white and tranſparent. Taken inwardly, camphire is cordial, ſudorific, and anodyne; uſed externally, it is a powerful diſcutient. The ancients believed it to be an enemy to generation, which proves to be a miſtake.

Subſtances reſembling camphire, and oil of camphire, are likewiſe obtained from the roots of Laurus Caſſia, termed by Kæmpfer Caſſia Canellifera, from the bark of which is alſo got, by diſtillation, an oil of cinnamon, and from the leaves, an oil of cloves. The ſame curious traveller informs us, that a camphire is depoſited in great abundance at the bottom of the oil obtained by diſtillation from the Arabian and Perſian Schœnanthus: and he doubts not that a ſimilar ſubſtance might be extracted from juniper and other plants, which have the camphire-ſmell, as the Bramins extract a ſugar from every ſweet, even from milk itſelf. A tree which grows naturally in Sumatra and Borneo yields a cryſtalline camphire, that is exceedingly precious and rare.

The tree which produces the gum or ſubſtance called benjamin is the *laurus benzoin* of Linnæus. The leaves are like thoſe of the citron and lemon-trees, only ſmaller, and leſs lucid.—Benjamin promotes expectoration, and is of great force and prevalence in the aſthma, and lingering phthiſical coughs. "It is likewiſe endued," ſays Lemery, "with a virtue to provoke urine and perſpiration."

Saſſafras-tree, the *laurus ſaſſafras* of Linnæus, grows naturally in many parts of North America, particularly Florida, where there are whole foreſts of it. It has a very ſtrait trunk, which riſes about ten feet high. The branches on its top are covered with green leaves like thoſe of the fig-tree, which the inhabitants eſteem an excellent vulnerary, when bruiſed.

bruiſed. The bark is reddiſh, thick, and rough, and more fragrant than the wood. When the wood is cut or raſped for uſe, the ſmell is ſo ſtrong that it occaſions the head-ach in thoſe that work upon it; as it likewiſe does in thoſe that uſe it, which has much leſſened its credit.—Uſed in infuſion like tea, the wood is a powerful antiſcorbutic.—In Carolina, a decoction of the wood and leaves has been adminiſtered with ſucceſs in intermitting fevers. In pains of the feet, an oil obtained from the broiled berries of ſaſſafras, rubbed into the part affected, though attended with a diſagreeable nauſea, never fails, ſays Kalm, to produce a ſpeedy and perfect cure.—The bark dyes an orange colour, that is particularly pleaſing to the eye, and does not fade in the ſun.—In New Jerſey, and other parts of North America, they waſh and ſcour the veſſels in which they intend to keep cyder, beer, or brandy, with water in which the ſaſſafras-root, or its peel, has been previouſly boiled—a precaution which they think renders all thoſe liquors both more palatable and more wholeſome. Some get their bed-poſts made of the wood of ſaſſafras, in order to expel the bugs: and in Penſylvania, for a ſimilar purpoſe, they put chips of it into their cheſts containing cloaths, and other woollen ſtuffs, to get rid of the larvæ and moths, which commonly ſettle in them in ſummer.—Saſſafras-wood, thrown into the fire, crackles like ſalt. It laſts, we are told, a long time under ground: yet is there hardly any kind of wood which, when expoſed to the air without cover, is more generally attacked by vermin, ſo as in a ſhort time to be quite worm-eaten through and through.

Cinnamon-tree, the *laurus cinnamomum* of Linnæus, is a native of the iſland of Ceylon in the Eaſt Indies. The leaves have three beautiful nerves, which run through the diſk or ſurface, and diſappear towards the top. The tree has three barks or rinds. The firſt and ſecond are only uſed; the third, and innermoſt, which incloſes the body of the tree, being never touched; not, as ſome have pretended, becauſe it is of no value; but becauſe an inciſion in it kills the tree. After three years time, the two extreme barks are

are renewed, and fit to be pulled off. When the Dutch, say some authors, who ingrofs the whole trade of this and the other spiceries, are apprehenfive of abating the value of cinnamon, by fending home too great abundance, and thereby glutting the European markets, they lay it on an heap, and burn as much of it as they imagine ufelefs for their fervice; which fpicy mountain fends out its fragrant exhalations for many leagues into the fea; fo that of thefe coafts it may be truly affirmed, in the beautiful language of Milton, that

"Pleas'd with the grateful fmell, old Ocean fmiles."

The Dutch, not remarkable for honefty in any of their dealings, are particularly fraudulent in conducting the fpice trade: for they frequently extract a quantity of oil, effence, or fpirits, from the cinnamon and cloves; and then confidently expofe them for choice untainted commodities. Hence we often meet with feveral fpiceries, cinnamon in particular, that are very dry and infipid, almoft devoid of fmell and tafte, and pillaged of their oil and effential fubftance.—The fruit of the cinnamon-tree yields, by coction and expreffion, an oily fubftance, of which candles are made for people of the firft rank: and from the neck of the root is drawn a fine kind of camphire, of a fpicy, aromatic fmell, very rarely to be met with in Europe.

"In Siberia," fays Gmelin, "they eat for ordinary food, the root of a fpecies of *polygonum*, termed by fome botanifts, *biftorta montana minor*; and by Haller, *biftorta foliis ad oram nervofis*. The natives call it *mouka*; and fo indolent are they, that, to fave themfelves the trouble of digging it out of the earth, they go in fpring and pillage the holes of the mountain-rats, which they find filled with thefe roots."

White Beet, the *Beta Cicla* of Linnæus, is a variety of the common Beet well known to be cultivated in gardens, as are all its varieties, for the fake of the leaves. "I mention it in this place with a view of introducing a feries of experiments made by M. Margraaf, with a view

view of extracting ſugar from the roots of this and ſome other vegetables. The plants which that ingenious philoſopher has examined chymically for the purpoſe juſt mentioned, are common in moſt countries, and demand neither a favourable ſoil, nor an aſſiduous culture.—Such are,

1° White Beet, *cicla officinarum*.

2° Skirret, *Sium Siſarum*.

3° Red Beet.

The roots of plants containing ſugar may be ſufficiently known by theſe characteriſtics. When cut into ſmall pieces, and carefully cleaned, they impreſs upon the palate a very agreeable ſenſation: and, if examined by the microſcope, exhibit a number of white cryſtalline particles, which are the ſugar of the plant. Sugar being a ſalt which is diſſolved in brandy, M. Margraaf imagined that it might likewiſe be extracted from vegetables with the aſſiſtance of that liquor. To determine the quantity of ſugar which might be diſſolved by this method, he put into a glaſs one ounce of the beſt and fineſt ſugar, well pulveriſed, with four ounces of the ſtrongeſt brandy. The whole being well digeſted, he made the mixture boil, and the ſugar was ſoon perfectly diſſolved. The ſolution being ſtill warm, he paſſed it through a very fine ſearce or ſieve into another veſſel. This he carefully ſtopped, and had the pleaſure at the end of eight days to find the ſugar reſtored, and formed anew into regular and beautiful cryſtals. To ſucceed in this experiment, it is neceſſary that the veſſel and the ſugar be well dried, and the ſpirit highly rectified.

Prepared by the experiment juſt related, the ingenious chymiſt cut into very thin ſlices ſome roots of White Beet, which he had ſelected for the purpoſe, and dried them before the fire, taking care, however, that they might not be burnt. He next reduced them to a groſs powder, which he a ſecond time dried, as it eaſily contracts humidity. Of this powder, whilſt ſtill hot, he put eight ounces into a glaſs veſſel, and poured over it ſixteen ounces of ſpirit ſo ſtrong that it kindled gun-powder. The veſſel being half full, he placed it, well ſtopped, into a ſand-heat, till the ſpirit began to boil:

2 ſhaking

ſhaking the powder at proper intervals, that it might not fall to the bottom.—As ſoon as the ſpirit had begun to boil, he removed the veſſel from the fire, and poured the mixture it contained as quickly as poſſible into a coarſe linen bag, ſqueezing it hard, in order to expreſs all the liquor. This he immediately paſſed, whilſt hot, through a finer cloth, into a glaſs veſſel, which he carefully ſtopped, and kept in a warm place. At firſt the liquor was diſturbed; but at the end of ſome weeks it had precipitated a cryſtalline ſediment, which had all the appearance and properties of ſugar in its leſs refined ſtate. By this firſt experiment, M. Margraaf extracted from the three roots formerly mentioned the following quantities of ſugar:

1. From half a pound of the root of White Beet, half an ounce of pure ſugar.

2. From half a pound of Skirret, an ounce and half of pure ſugar.

3. From the ſame quantity of Red Beet, an ounce and a quarter of ſugar equally pure.

Theſe experiments prove, that lime-water is not ſo neceſſary for drying and thickening the ſugar as certain chymiſts have pretended, ſince it certainly cryſtalliſes without it.

Being thus well aſſured from actual obſervation, that the plants in queſtion were poſſeſſed of a real ſugar, he next employed himſelf in diſcovering a leſs expenſive method of extracting it. Such an end, he thought, would moſt effectually be attained, 1°, by expreſſing the ſweet ſugar juice, purifying it, and diſpoſing it to cryſtallize by evaporation;—2°, by purifying the cryſtals which might reſult from the preceding operations.

Having taken with this view, a certain quantity of Skirret, he cut the freſh roots into very ſmall pieces, and having bruiſed them with all his ſtrength in an iron mortar, removed them into a linen bag, and expreſſed the juice by means of a preſs prepared for that purpoſe.—He then poured water upon the roots in the bag, and preſſed them a ſecond time. The liquor thus obtained he put into proper veſſels, and kept in a cool place for 48 hours, at the end of which time it was clear,

clear, and a meally fubftance had fallen to the bottom. He now, therefore, very gently paffed the liquor through a fine linen cloth into another veffel.

The firft clarification thus accomplifhed, he added to the juice fome whites of eggs, and then boiled the whole together in a copper pan, continuing to fkim it, till there appeared no more impurities on the furface, and the liquor was as tranfparent as the brighteft and beft clarified wine. He boiled it a fecond time in a leffer pan, till it had loft confiderably of its quantity; and thus he continued, ufing ftill fmaller veffels, till the liquor, originally thin, was reduced to a fyrup of a pretty thick confiftence. This he kept in a warm place for fix months, at the end of which time he found the fugar collected upon the fides of the veffel in the form of cryftals. To purify thefe, which was the fecond and principal operation, he immerfed the veffel containing them into warm water, and when the heat had rendered the mixture fluid, he poured over the liquor and the cryftals into an earthen veffel having a very large mouth, with a narrow bottom pierced with feveral holes. This veffel he placed within another, and left them in this fituation, in a temperate place. By degrees the fyrup fell into the veffel below, whilft the cryftals remained in the upper.

To render this raw fugar ftill purer, he now put it into a fort of blotting paper folded in different forms, which he gently fqueezed with his hand. It had the defired effect: the paper imbibing much of the vifcous and tenacious fyrup which was attached to the fugar.

Thus freed of its impurities, he diffolved it a fecond time in water, paffed it again through the fineft linen, and boiled it to the confiftence of a thick fyrup. He then added fome lime-water, and after boiling it a-frefh, till it was ropy, took it off the fire, and kept ftirring it till cool; when he once more poured it over into earthen veffels of a conical form, ftopped with wood. Thefe he put within other veffels of the fame form and fubftance, but thicker: and the cryftals in the courfe of eight days being completely formed, he, after that period, fuffered the fyrup to flow into the lower veffel,

vessel, and drying the sugar by means of the blotting-paper as before, had the satisfaction to find it as pure and beautiful as the best sugar which is produced from the sugar-cane: and the syrup to serve the same purposes as common treacle.

By the same operation may sugar be extracted from White and Red Beet. That of Skirret is superior to the sugar obtained from Red Beet: but the sugar from the White Beet M. Margraaf affirms to be the best of all.

Continuing his experiments, this ingenious naturalist next essayed to extract sugar from the stems and leaves of these plants; but from those with all his efforts he could only obtain a sort of earth.

Might it not be very advantageous for the poor inhabitants of the country to procure to themselves a sugar from such common plants as have been mentioned, instead of purchasing foreign sugar at so dear a rate? In such a case, it would not be necessary that they should follow all the steps of the process just described;—it would be sufficient to express the juice, to purify it a little, and boil it to the consistence of a syrup.

Encouraged by the success of these experiments—experiments which plainly evince that the countries which produce sugar-canes, produce them not exclusively, since Nature has furnished every country with sugar-plants—Margraaf has since extended his enquiries on the same subject to a great number of vegetables. I shall mention the result of a very few only. Carrot yields a very sweet juice, but resembling honey rather than sugar. The same is affirmed of the Gourd. From Parsnip he procured a small quantity of sugar, as likewise from the American Aloe. The juice which is obtained from the Birch-tree by incision in water, yields a sort of manna. Lastly, grapes moistened, and then pressed, give a syrup which contains a little sugar.

HOROLOGIUM *Floræ*. *Vide* VIGILIÆ.

HYBERNACULUM, winter-quarters; defined by Linnæus to be a part of the plant which defends the embryo-herb from injuries during the severities of winter. *Vide* BULBUS & GEMMA.

HYBRIDA *Plantæ*, a monſtrous production of two different ſpecies of plants, analogous to a mule among animals.—The ſeeds of hybrid plants will not propagate.

I.

ICOSANDRIA, (from εἰκοσι, twenty, and ἀνηξ, a man or huſband); the name of the twelfth claſs in Linnæus's Sexual Method, conſiſting of plants with hermaphrodite flowers furniſhed with twenty or more ſtamina, that are inſerted into the inner ſide of the calyx, or petals, or both. By this laſt circumſtance, and not by the number of ſtamina, is the claſs in queſtion diſtinguiſhed from that immediately following it, termed *polyandria*, in which the number of ſtamina is frequently the ſame with that of the plants of the claſs *icoſandria*, but they are inſerted, not into the calyx or petals, but into the receptacle of the flower.

This nice and minute diſtinction requires the ſtricteſt attention, becauſe of the very different nature of the plants of theſe two claſſes. *Icoſandria* furniſhes the pulpy fruits that are moſt eſteemed, ſuch as apples, pears, pomegranates, medlars, gooſeberries, raſpberries, ſtrawberries, currants, almonds, peaches, plums, apricots, cherries, and guavas. The plants of the claſs *polyandria* are moſtly poiſonous: ſuch, for inſtance, are aconite, columbine, lark-ſpur, hellebore, virgin's bower, pæony, herb-chriſtopher, burning thorny plant, and ſome others.

Beſides the characters juſt mentioned, the plants of the claſs *icoſandria* have a hollow flower-cup compoſed of one leaf, to the inner ſide of which the petals are faſtened by their claws.

The orders in this claſs are five, founded upon the number of the ſtyles or female organs.

Mock-orange, myrtle, almond, and plum trees, have one female organ; wild ſervice has two; ſervice and ſeſuvium, three; medlar, apple, fig-marigold and ſpiræa, five; roſe, raſpberry, ſtrawberry, herb-bennet, and cinquefoil, an indefinite number.

IMPERFECTUS

IMPERFECTUS *Flos.* *Vide* APETALUS *Flos.*

IMPLETIO. *Vide* PLENUS *Flos.*

INCOMPLETÆ, the name of the ninth claſs in Royen's Natural Method, and the ſixteenth in Linnæus's *Methodus Calycina*; conſiſting of plants whoſe flowers want either the calyx or petals.

INCOMPLETUS *Flos.* *Vide* APETALUS *Flos.*

INFLORESCENTIA, (from *infloreſco*, to flouriſh,) a mode of flowering; the manner in which flowers are ſupported on their footſtalks.

The various modes in which flowers are joined to the plant by the *pedunculus* or footſtalk, are expreſſed by the following terms:

VERTICILLUS.
SPICA.
CORYMBUS.
CAPITULUM.
FASCICULUS.
THYRSUS.
RACEMUS.
PANICULA.

Each of theſe terms is explained in its proper place.

We may here obſerve that the various modes of flowering juſt mentioned are equally applicable to thoſe flowers which proceed from the angle formed by the leaves and branches, as do moſt flowers, and to ſuch as terminate the ſtem and branches. In the former caſe, flowers are termed *axillares*, that is, proceeding from the arm-pit of the leaf: in the latter, *terminales*, that is, terminating the branch.

Some terms reſpecting infloreſcence will be explained under the article PEDUNCULUS, which ſee.

Infloreſcence affords an excellent characteriſtic mark in diſtinguiſhing the ſpecies of plants, but is never, according to Linnæus, to be employed as a generic difference. Many eminent botaniſts, however, among whom are Ray, Rivinus, Knaut, and Kramer, have employed it in diſcriminating the genera.

INTORSIO, a term of habit refpecting the flexion or bending of any of the parts of a plant towards one fide.

Twining Stems.

In hops, honeyfuckle, diofcorea, black bryony, hippocratea, and moon-feed, the ftalks twine to the left; in kidney-bean, convolvulus, Virginian-filk, quamoclit, and fpurge, they bend towards the right.

Twining Clafpers or Tendrils.

Thefe wind to the right, and back again: of this kind are the tendrils of moft of the pea-bloom or leguminous tribe of plants.

Twifted Flowers.

In fwallow wort, oleander, periwinkle, Virginian-filk, and ftapelia, the petals bend to the left; in *pedicularis*, to the right.

The pointal in cucubalus, and vifcous campion, is twifted to the left; as is the feed-bud in fcrew-tree, and *fpiræa ulmaria.*

The fpikes of flowers in claytonia, and fome fpecies of rough-leaved plants, are fpirally twifted; in poppy, martagon lily, guinea-hen weed, and lizard's tail, they are bowed or crooked.

In oats, the beard which terminates the hufk is twifted like a rope. The proper coat of the feeds of fome fpecies of geranium has a fpiral tail of the fame kind. This fpecies of contorfion being affected by the moifture or drynefs of the atmofphere is termed by Linnæus, *intorfio hygrometrica.*

To the different fpecies of intorfion may be added the appearance of the petals in the European fpecies of violet, oriental bugle, bafil, and a fpecies of fatyrium, in which the upper lip of the *corolla* looks towards the ground, and the under lip upwards. This appearance is termed by Linnæus, *refupinatio.*

INUNDATA *Loca*, (*inundari*, to beover flowed,)—a term of ſoil—places covered with water.

INUNDATÆ, the name of the fifteenth order in Linnæus's Fragments of a Natural Method, conſiſting of plants which grow in the water.

Liſt of Genera *contained in this Order.*

Linnæan Genera.			*Engliſh Names.*
Ceratophyllum,	—	—	Horned pond-weed.
Elatine,	—	—	Water-wort.
Hippuris,	—	—	Female horſe-tail.
Myriophyllum,	—	—	Water-milfoil.
Potamogeton,	—	—	Pondweed.
Proſerpinaca.			
Ruppia.			
Zannichellia,	—	—	Triple-headed pondweed.

Habit and Structure of the Plants of this Order.

The plants of this order are aquatic, of low ſtature, herbaceous, and moſtly perennial.

The ROOTS are fibrous.

The STEM is generally wanting. In its place are an aſſemblage of leaves, which, wrapping or enfolding one another mutually, form a ſheath, from the middle of which is produced the foot-ſtalk of the flower.

The LEAVES are ſometimes alternate, ſometimes placed in whorls round the ſtem. In a great many genera, the foot-ſtalk is extended at its origin into a membranaceous ſubſtance forming a ſheath, that is cleft through the whole length, on the ſide oppoſite to the leaf.

In ſome ſpecies of pondweed the ſheath in queſtion is exactly like that of the graſſes, being terminated at the top, like the plants of that natural family, with a membranaceous triangular crown. In water-milfoil, ceratophyllum, and proſerpinaca, the footſtalk of the leaves forms no ſheath of this kind. The leaves of an aquatic plant of Madagaſcar, which

 Adanſon

Adanſon affirms to be nearly alled to pondweed, are pierced through the ſieve in different places round the ribs.

Few, if any, of theſe plants are covered with down or hair.

The FLOWERS are hermaphrodite in pondweed, proſerpinaca, elatine, hippuris and ruppia; male and female on the ſame root in the reſt. Adanſon pretends, with what foundation I know not, that the flowers in ruppia are likewiſe male and female upon the ſame ſpike.

The diſpoſition of the flowers in this order ſerving frequently of itſelf to diſtinguiſh the genera, deſerves particular attention.

I. The flowers in water-milfoil, ceratophyllum, proſerpinaca, elatine and hippuris, proceed ſingly from the wings of the leaves. Thoſe of the lower leaves of water-milfoil are female; thoſe of the upper, male.

II. Triple-headed pondweed has two flowers in the ſame wing; one male and the other female.

III. The flowers in pondweed and *ruppia* are diſpoſed in ſpikes in the wings of the leaves. In *ruppia*, ſays Adanſon, male flowers are arranged on one ſide of the ſpike, and female flowers on the other.

The FLOWER-CUP is either wanting, as in hippuris and zannichellia; or conſiſts of three, four or five diviſions or leaves, which accompany the ſeed-bud to its maturity.

The PETALS are generally wanting.—*Elatine* has four petals, that are egg-ſhaped, blunt, and ſpreading. Pondweed has a like number.

The STAMINA are in number from one to ſixteen and upwards. The filaments, in ſome genera, are ſo ſhort, that they ſeem wanting.

The anthers or tops are ſhort, and generally marked with four longitudinal furrows. In ruppia, the anthers have one cell, and open at top.

The SEED-BUDS are in number from one to four. The ſtyle is frequently wanting.—In *proſerpinaca*, the ſeed-bud is placed below the receptacle of the flower.

The SEED-VESSEL is univerſally wanting, except in *elatine*,

elatine, which has a dry capſule with four external openings, and the ſame number of cells.

The Seeds are generally four in number.—In *ceratophyllum*, the fruit is a nut or ſtone, which is egg-ſhaped, pointed, and contains a ſingle cell.

INVOLUCRUM, (from *involvo*, to roll or wrap up) a ſpecies of calyx reſtricted by Linnæus to umbelliferous flowers.

It is placed below the common receptacle, which in theſe flowers is a number of foot-ſtalks, that proceed from the ſame centre, and riſe to the ſame height. Each foot-ſtalk is terminated with an umbel ſimilar in its form and ſtructure to the large umbel, and generally furniſhed like it with an *involucrum* or cover. When a calyx of this kind is placed under the longer or univerſal umbel, it is ſtiled an univerſal cover; when under the partial or ſmaller umbel, a partial cover. *Vide* Umbella & Umbellatæ.

Umbelliferous flowers, beſides the two covers already mentioned, have generally a proper perianthium or flower-cup under each of the florets of which the umbel is compoſed.

The partial *involucrum* of an umbelliferous flower is ſometimes termed *involucellum*, that is, leſſer cover.

The univerſal cover is either of one leaf, as in coriander and caraway; of three, as in angelica; of four, as in baſtard ſtone-parſley; of five, as in Macedonian parſley; of ſeven, as in lovage; or of many, as in laſerwort and water drop-wort.

The partial cover conſiſts either of two leaves, as in artedia; of five, as in hare's ear; or of many, as in biſhop's weed and fennel giant.

In ſanicle, the univerſal, in coriander, the partial cover, goes but half way round the receptacle formed by the foot-ſtalks or rays of the umbel.

Thapſia, parſnep, alexanders, dill, burnet-ſaxifrage, and herb gerard, want both the univerſal and partial cover; ſhepherd's needle, chervil, maſterwort and ſeſeli, are furniſhed with the partial, but want the univerſal cover.

IRREGULARIS

IRREGULARIS *flos*, an irregular flower; a flower that wants uniformity; the term is generally applied to the petals, and is ſynonymous to the *anomalus* of Tournefort, and the *difformis* of Jungius and Chriſtian Knaut.

Examples of flowers with irregular petals are exhibited in the pea-bloom or leguminous tribe of plants, the lipped-flowers, violet, aconite, lark-ſpur, and ſome others.

IRREGULARES. The name of a diviſion in Rivinus's Method, conſiſting of plants which have irregular flowers. *Vide ſupra.*

ISOSTEMONES (from ἴσος, equal, and ſtamen). The name of a claſs in Haller's Natural Method, conſiſting of plants whoſe ſtamina or male organs of generation are equal in number to the petals. Such are pimpernel, campanula, night-ſhade, bryony, borage, apocynum, and the umbelliferous flowers.

Moſt of Linnæus's claſs *pentandria* belong to this diviſion of Haller.

JULIFERÆ, (from *julus*, a catkin, and *fero*, to bear,) trees bearing flowers in catkins. The name of a claſs in Hermannus's Syſtem, correſponding to the *amentaceæ* of Boerhaave and Tournefort. *Vide* AMENTACEÆ and AMENTACEUS *flos*.

JULUS, (Ἴȣλος, lanugo, quæ ἵεται ȣ̓λη, exit mollis). Catkin. By this term, as likewiſe by the names, *nucamentum* and *catulus*, ſome former botaniſts diſtinguiſhed the ſpecies of calyx called by Linnæus *Amentum*, which ſee. The term is manifeſtly as old as Pliny, who, in the 39th Chapter of the 16th Book of his Natural Hiſtory, uſes it of the hazel-tree, an amentaceous or catkin-bearing plant.——*Ferunt et Avellanæ Julos compactili callo ad nihil utiles.*

L.

LABIATUS *flos*, a lipped-flower; a flower conſiſting of one irregular petal whoſe diviſions reſemble two lips. The lipped-flowers conſtitute a claſs in Tournefort's Method, by

by the name of *labiati*, and are the *didynamia gymnospermia* of Linnæus, and the *verticillatæ* of Ray; by which name, likewise, they are diſtinguiſhed in Linnæus's Fragments of a Natural Method. *Vide* VERTICILLATÆ.

Mint, thyme, marjoram, balm, dead nettle, and hyſſop, furniſh examples of the term in queſtion. Lipped-flowers make part of the grinning or gaping flowers of Linnæus. *Vide* COROLLA *ringens*.

LACINIÆ, (properly fringes, lappets, pieces, or jags.) In botanical language the ſeveral ſections of the calyx, petals, and piſtillum. The term is likewiſe applied to leaves.

LACTESCENTIA, (from *lac*, milk). A term of habit reſpecting the juices or liquors, of whatever colour, which flow out of plants when any injury is done them.

The colour of the juices in queſtion is either

White, as in burning thorny plant, poppy, ſwallow-wort, apocynum, cynanchum, campanula, cardinal flower, ſheep-ſcabious, maple, ſumach, milk-parſley, a ſpecies of melon-thiſtle, ſow-thiſtle, dandelion, hawk-weed, nipple-wort, and the other compound flowers with flat or tongue-ſhaped florets, the *ſemifloſculoſi* of Tournefort, the *flores ligulati* of Linnæus.

Yellow, as in celandine, *bocconia*, and puccoon.

Red, as in bloody dock.

Moſt lacteſcent plants are poiſonous, except thoſe with compound flowers, which are generally of an innocent quality.

Of the poiſonous lacteſcent plants the moſt remarkable are ſumach, agaric, maple, burning thorny plant, caſſada, celandine, puccoon, prickly poppy, and the plants of the natural order *contortæ*, as ſwallow-wort, apocynum, cynanchum, and cerbera.

The bell-ſhaped flowers are partly noxious, as cardinal flower; partly innocent, as campanula.

Among the lacteſcent plants with compound flowers that are innocent in their quality, may be mentioned dandelion, picris, hyoſeris, wild lettuce, gum-ſuccory, hawkweed,

baſtard

baſtard hawkweed, hypochœris, goat's beard, and moſt ſpecies of lettuce: I ſay moſt ſpecies, becauſe the prickly ſpecies of that genus are of a very virulent and poiſonous nature.

LACTESCENTES. The name of a claſs in Moriſon's Method, conſiſting of plants with compound flowers which abound with a white milky liquor. Such are the ſemi-floſculoſi of Tournefort, juſt mentioned. *Vide ſupra.*

LAMINA, a plate; the upper ſpreading part of a flower conſiſting of more than one petal. *Vide* COROLLA.

LANA, wool; a ſpecies of pubeſcence, down or velvet, which ſerves, according to Linnæus, as a veil to ſcreen the leaves and branches which are covered with it from the extremities of heat.

The appearance in queſtion is very conſpicuous in horehound, mullein, ſtachys, ſage and iron-wort of canary, woolly thiſtle, and ſome others.

LEGUMEN, (properly all manner of pulſe, as peaſe, beans, &c.)—that ſpecies of the ſeed-veſſel termed a pod, in which the ſeeds are faſtened along one ſuture only. In this laſt circumſtance, the ſeed-veſſel in queſtion differs from the other kind of pod, termed by botaniſts *ſiliqua*, in which the incloſed ſeeds are faſtened alternately to both the ſutures or joinings of the valves. *Vide* SILIQUA.

The ſeed-veſſel of all the pea-bloom or butterfly-ſhaped flowers, the *diadelphia* of Linnæus, is of the leguminous kind. Such, for inſtance, is the ſeed veſſel of the pea, vetch, lupine and broom. *Vide* PAPILIONACEÆ.

The valves or external openings for the purpoſe of diſperſing the ſeeds are, in both kinds of pod, two in number.

LEGUMINOSÆ (from *legumen*). The name of a claſs in Moriſon, Hermannus, Boerhaave, Ray, and Royen, conſiſting of plants whoſe ſeeds are incloſed in a leguminous pod. The term correſponds to the *papilionacei* of Tournefort and Pontedera, and the *diadelphia* of Linnæus in his Sexual Syſtem. *Vide* LEGUMEN.

LIBER, the inner bark or rind of plants. For a particular deſcription of the bark, and the other internal organized

nized parts of vegetables, the reader is referred to the article STRUCTURA VEGETABILIS.

LIGNUM, the wood. *Vide* STRUCTURA VEGETABILIS.

LIGULATUS *flos*, (from *ligula*, a ſtrap or fillet) a ſpecies of compound flower ſo termed by Linnæus, all the florets or partial flowers of which are flat or tongue-ſhaped, and expanded towards the outer ſide.

Of this kind are dandelion, ſow-thiſtle, lettuce, ſuccory, nipple-wort, hawkweed, goat's beard, ſcorzonera, picris, and ſome others. The flowers in queſtion correſpond to the *ſemifloſculoſi* of Tournefort, the *lingulati* of Pontedera, the *planipetali* of Boerhaave and Ray, the *cichoracei* and *acanaceæ* of Cæſalpinus, and the *lacteſcentes* of Moriſon.

Theſe plants generally abound with a milky juice, which is of an innocent quality.

LILIACEI, (from *lilium*, a lily). The name of the ninth claſs in Tournefort's Method, conſiſting of plants, whoſe flowers reſemble thoſe of the lily, being generally compoſed of ſix regular petals; ſometimes, however, of three, or even of one that is deeply divided into ſix parts. The ſeeds of the liliaceous flowers are generally contained within a capſule having three cells.—Aſphodel, lily-aſphodel, hyacinth, grape-hyacinth, meadow ſaffron, bulbocodium, crocus, narciſſus, iris, corn-flag, aloe, Adam's needle, Indian flowering reed, ginger, blood-flower, flower-of-a-day, ſpiderwort, lily, ſquill, crown imperial, tulip, dog's tooth violet, ſuperb lily, ſtar of Bethlehem, *aphyllanthes*, leek, onion, garlick, amaryllis, ſnow-drop, and bermudiana, are the liliaceous flowers of Tournefort.

LILIACEÆ is likewiſe the name of an order in the former editions of Linnæus's Fragments of a Natural Method, conſiſting of only four genera: viz. the lily, tulip, dog's-tooth violet, and crown imperial; which, in the later editions, are arranged with ſeveral other genera, under an order diſtinguiſhed, ſomewhat improperly, by the name of *coronariæ*. *Vide* CORONARIÆ.

LILIA. The name of the ſecond claſs in Royen's

Natural

Natural Method, correſponding to the liliaceous flowers of Tournefort, and the *coronariæ* of Linnæus.

LIMBUS, (properly a lace, border, or fringe,)—the *limb*, or upper expanded part of a flower conſiſting of only one petal: oppoſed to the tube, which is the loweſt part.

The limb is either bell-ſhaped, funnel-ſhaped, ſalver-ſhaped, wheel-ſhaped, or gaping. *Vide* COROLLA.

LINGULATUS *flos*. *Vide* LIGULATUS *flos*.

LINGULATI, the name of a claſs in Pontedera's Syſtem, conſiſting of compound flowers with flat tongue-ſhaped petals. It correſponds to the *ſemifloſculoſi* of Tournefort, the *planipetalæ* of Ray, and the *compoſiti ligulati* of Linnæus, and is exemplified in dandelion and endive. *Vide* SEMIFLOSCULOSI, &c.

LOCULAMENTA and LOCULI, cells or pockets. The internal diviſions of a capſule or other dry ſeed-veſſel ſo termed. *Vide* CAPSULA.

Theſe cells incloſe the ſeeds, and are either one in number, as in primroſe and gentian; two, as in hen-bane, tobacco and thorn-apple; three, as in lily, hyacinth, aloe, and Adam's needle; four, as in ſpindle-tree, penæa and blæria; five, as in winter-green and rue; ſix, as in aſarabacca and birthwort; eight, as in a ſpecies of flax, called *radiola*; ten, as in moſt ſpecies of flax; many, as in water-lily.

The term LOCULUS is alſo ſometimes uſed to expreſs the minute diviſions in ſome ſpecies of *anthers* which contain the fine impalpable powder, ſuppoſed by the Sexualiſts to be the principal agent in the generation of plants.

LOCUSTA, Ray's term for the huſky calyx of the graſſes. *Gluma* is now ſubſtituted in its place. *Vide* GLUMA.

LOMENTACEÆ, (from *lomentum*, a colour, waſh, or dye, à *lotum*, as *fomentum* à *fotum*—likewiſe Bean-meal).—The name of the thirty-third order in Linnæus's Fragments of a Natural Method, conſiſting of plants, many of which furniſh beautiful tinctures or dyes, and whoſe *pericarpium*, univerſally (*polygala* excepted,) a leguminous pod, contains ſeeds that are farinaceous or meally, like thoſe of the bean.

Note.—Which of theſe characters, or whether both in conjunction, determined Linnæus to affix the name *Lomentaceæ* to the following genera, we poſſeſs no means of aſcertaining: and it ſeems rather ſtrange, that Giſeke and Fabricius, who lately publiſhed Linnæus's own Explanations of his Natural Orders, have not offered a ſingle word on the ſubject.

Linnæan Genera.			*Engliſh Names.*
Adenanthera,	—	—	Baſtard flower-fence.
Bauhinia,	—	—	Mountain-ebony.
Cæſalpinia,	—	—	Braſiletto.
Caſſia,	—	—	Wild ſenna.
Ceratonia,	—	—	Carob-tree, or St. John's bread.
Cercis,	—	—	Judas tree.
Gleditſia,	—	—	Honey-locuſt, or triple-thorned acacia.
Guilandina,	—	—	Bonduc, or nickar-tree.
Hæmatoxylon,	—	—	Logwood.
Hymenæa,	—	—	Locuſt-tree or courbaril.
Mimoſa,	—	—	Senſitive plant, acacia, &c.
Parkinſonia.			
Poinciana,	—	—	Barbadoes flower-fence, or Spaniſh carnation.
Polygala,	—	—	Milkwort.

This order, in its general appearance, ſo nearly reſembles the pea-bloom or butterfly-ſhaped flowers, that, to avoid repetitions, we ſhall only, in this place, mention the few circumſtances in which the two orders differ.

I. In all the plants of this order, except milk-wort, the filaments of the ſtamina are diſtinct.

II. The flower is not ſhaped like a butterfly, but is leſs irregular, and frequently conſiſts of but one petal.

The Leaves are either ſimple, as in judas-tree; or winged, as in the greater number.

The

The SEEDS are generally marked with a circular furrow on both ſurfaces.

The plants of this natural order, like thoſe of the leguminous tribe, are generally mucilaginous. From the inner bark of the greater number exſudes, either naturally or by inciſion, a mucilaginous liquor, which, in acacia and courbaril, dries upon the plant, and becomes a gummy ſubſtance.

Braſiletto, or Braſil-wood, the *Ceſalpinia Braſilienſis* of Linnæus, is much uſed by dyers. The tree, from which it is cut, is very thick and large, and has long branches that bear a vaſt quantity of little roundiſh leaves, of a fine ſhining green. The bark is reddiſh and thorny. The heart of the wood only is uſed; it is ſaid to have the ſame virtue with red ſanders, but is little uſed in medicine. Boiled in water with a little allum, Braſil-wood will ſtrike a red dye into eggs that are boiled along with it; it is alſo uſed for colouring althea roots to clean the teeth. The raſpings of Braſil-wood, infuſed in vinegar with a little gum arabick and allum, produce a beautiful blood-red tincture, which ſerves either for ink, or for dying of ſkins, book-covers, and the like. The ſame raſpings, infuſed in water, ſerve for the dying of wool, which will not turn purple, nor eaſily ſuffer decay.

Cæſalpinia Sappan, the Lignum Sappan of Rumphius, the Tſiam Pangam of the *Hortus Malabaricus*, is a native of both Indies, and, in its general habit, reſembles ſome of the Acacias. The tree riſes with a very prickly ſtem, from which proceed branches that are covered with large winged leaves. The flowers are yellow, grow in cluſters, and are ſucceeded by very broad ſmooth pods. The wood, termed Sappan, is of a red colour, and uſed in dying like Braſiletto, which it nearly reſembles.

The caſſia fiſtula tree, the fruit of which is an approved medicine, grows naturally in the Eaſt and Weſt Indies, as well as in Egypt, and ſeveral parts of Aſia. Its height, when full grown, often exceeds thirty or forty feet. The

bark,

bark, efpecially upon the trunk, is very much furrowed and cracked; the wood is white and foft; the tree generally branches pretty near the top, and bears feveral middle-fized fharp-pointed green leaves. The flowers are produced in clufters, and confift each of five petals, which are of a yellow colour and agreeable fmell, and are fucceeded by blackifh pods, from ten to twenty inches long, and about three quarters of an inch diameter, having a feam running the whole length on the one fide, and another lefs vifible on the other. The excellence of caffia is generally eftimated by the length, thicknefs and weight of the pods which contain it. The infide is divided into a great many cells, feparated from each other by thin brittle plates or partitions, covered with a black fweet pulp; between thefe partitions are placed the feeds, which are fmall, flat and fmooth. The pulp is the part which is ufed in medicine. It gently loofens the belly, and ejects the fæces without occafioning gripes. —M. Labat relates that the caffia-pods ufed formerly to be preferved as comfits, and fent to Europe, where they were adminiftered as a gentle and agreeable purgative. The pods fo preferved were gathered when extremely tender, and about two or three inches only in length; fo that pod, pulp and all, were equally ufed, and equally efteemed. The flowers were preferved in like manner, and prefcribed with fuccefs in fimilar diforders.—Caffia fiftula is thus prepared in Egypt. The pods are collected before they are quite ripe, and carried into a very clofe room, in which has been previoufly prepared a bed of palm-leaves and ftraw, fix inches thick. On this they lay the pods in a heap; the door is then clofely fhut; and the next day they fprinkle water on the heap, which is repeated the day following.—In this manner they lie heaped for forty days, till they become black; others dig a hole in the ground to put them in; but this method is greatly inferior to the former.—It is to the Arabians we owe the knowledge of the medicine in queftion; the Greeks and Romans being entirely unacquainted with it. The Alexandrian caffia is the beft; what we principally ufe, however, is the American, on account of the fcarcity of

of the former. The Brazil caſſia is aſtringent while green, but purges twice as ſtrongly as any other kind when ripe. The chief excellence of caſſia is, that it is a proper purge in all inflammatory caſes, which cannot be affirmed of any other known cathartic.

Senna of the ſhops is the leaf of the *caſſia ſenna* of Linnæus. The ſhrub which produces it is about a foot high, and grows naturally in Egypt, and ſeveral parts of the Levant. The fineſt ſenna is that from Alexandria, called by the Turks palte, which pays a conſiderable tribute to the Grand Signor. This ſort bears narrow leaves of a moderate ſize, lancet ſhaped, yellowiſh, and of a ſtrong, ſweet, fragrant ſmell.

The Tripoli ſenna, which is green, comes next in virtue to the Alexandrian, but is eaſily diſtinguiſhed by its little ſmell.

Caſſia Javanica, or broad-podded caſſia, is a native of Java, Braſil, and other parts of both Indies. It has compound winged leaves, conſiſting of twelve or fourteen pair of lobes, fleſh-coloured flowers, and very large, thick, three-ribbed pods. In America this ſpecies of caſſia is commonly known by the name of Horſe-Caſſia, from the black purging pulp which ſurrounds the ſeeds being generally adminiſtered in medicine to horſes only, on account of its griping quality. In the ſhops this ſpecies is termed purging caſſia of Braſil.

Kalm aſſerts that *Caſſia Chamæcriſta*, which grows abundantly in the woods of North-America, and whoſe leaves reſemble thoſe of the ſenſitive plant, poſſeſſes likewiſe the quality of contracting them when touched, in common with the leaves of the latter.

The flowers of the Canada ſpecies of judas tree, commonly called red-bud tree, are frequently put into ſalads by the inhabitants of that country. The French too ſometimes pickle them; but they have little flavour.

The wood of the common judas tree, called by the Portugueſe, the tree of love, is very beautifully veined with black and green, and admits of an exceeding fine poliſh.

The roots of moringa, a ſpecies of *guilandina*, are ſcraped when

when young, and ufed by the inhabitants of the ifland of Ceylon, and the Malabar coaft, where the tree naturally grows, as thofe of horfe-radifh are in Europe. The wood dyes a beautiful blue colour.

Logwood, or Campeachy-wood, grows naturally in the Bay of Campeachy, at Honduras, and other parts of the Spanifh Weft-Indies. It is much efteemed among the dyers and hatters for the fine purple and black colours which it produces. Pomet and Lemery have confounded this tree with that which produces the pimento or allfpice. The latter is the myrtus pimento of Linnæus. *Vide* HESPERIDEÆ.

The fpecies of acacia which produces gum-arabic, frankincenfe, and the *fuccus acaciæ*, is the *mimofa nilotica* of Linnæus, and not the *mimofa fenegal*, as was long imagined. The gum is gathered in vaft quantities from the trees growing in Arabia Petræa, at the foot of Mount Sinai, whence they bring the frankincenfe, called by the dealers in drugs in Egypt, gum-thus, from Thur or Thor, the name of a harbour in the North Bay of the Red-Sea, near Mount Sinai; thereby diftinguifhing it from the gum-arabic, which is brought from Suez, another port of the Red-Sea, not far from Cairo.—Befides the different places from which thefe gums are brought, they differ alfo in fome other particulars. Frankincenfe is pellucid, of a white colour, brittle, and eafily pulverized; gum-arabic is lefs pellucid, and of a brown or dirty-yellow colour.

Succus acaciæ is an infpiffated juice obtained by expreffion from the pods of the fame fpecies of acacia which produces the two valuable fubftances already mentioned. It is generally expreffed before the fruit is ripe, and is black without, and reddifh or yellowifh within.

In its general habit, *mimofa nilotica* has certainly a great refemblance to that fpecies of acacia which produces the gum-fenega.—We have, therefore, the lefs reafon to be furprized, that it fhould fo long, by the undifcerning, have been confounded with it. They may be diftinguifhed by the following characters. Gum-fenega acacia, the *mimofa fenegal*

gal of Linnæus, is covered with a white, true acacia, or acacia of the Nile, with a purple, bark. The former, too, protrudes its thorns at the inſertion of the leaves by threes; the latter by pairs. Two thorns likewiſe accompany the doubly-winged leaves of another ſpecies of acacia, which acacia of the Nile much reſembles, the *mimoſa farneſiana* of Linnæus, known in the Weſt-Indies by the name of ſponge-tree, and remarkable for the fragrancy of its flowers; but theſe thorns are not ſo long as in the true acacia, which alſo has its heads of flowers furniſhed with footſtalks; whereas, in ſponge-tree, footſtalks are wanting to the flowers.

Gum-Senega or Senegal, juſt mentioned, is produced from a tree which grows plentifully in ſeveral parts of Arabia, and of Africa, particularly in Guinea and Negro-land, whence it is brought by the blacks, who carry it on their back, or on camels, in panniers made of palm leaves, to Senegal, and from this laſt place it is tranſported to the ſeveral parts of Europe. It is generally brought to us in large pieces; and, what is commonly ſold for gum-arabic, is nothing elſe than gum-ſenega, broken into ſmall pieces. The gum in queſtion is pectoral, moiſtening and refreſhing, gives conſiſtence to the humours, when they become too ſerous, cures rheums, and is reckoned ſpecific in dyſenteries, the piles, and other hæmorrhages. It is, however, principally in the manufacture of various ſtuffs, and of ſeveral dying materials, that a large quantity of it is conſumed, and its chief uſe and excellence conſiſt.

The Senſitive and Humble plants are arranged by Linnæus under the ſame genus with the acacias. Theſe are well known to poſſeſs a kind of muſcular motion, by which the leaves and ſtalks are contracted and fall down, upon being ſlightly touched, or ſhaken with ſome degree of violence. The ſenſibility of theſe plants is lodged in the young branches, in the common foot-ſtalk of the winged leaves, and in the nerve or middle rib to which the lobes or leſſer leaves are attached. Theſe different motions, which ſeem to be totally independent of one another, may be aptly enough

compared

compared, by analogy, with the irritability of certain parts in animals.

The ſenſitive plant has two kinds of motion; the one natural, occaſioned by the action of warm nouriſhing vapours; the other artificial, in conſequence of being touched or ſhaken.

M. Duhamel having obſerved, about the fifteenth of September, in moderate weather, the natural motion of a branch of ſenſitive plant, remarked, that at nine in the morning, it formed with the ſtem an angle of one hundred degrees; at noon, of one hundred and twelve degrees; at three afternoon, it returned to one hundred; and after touching the branch, the angle was reduced to ninety. Three quarters of an hour after, it had mounted to one hundred and twelve; and, at eight at night, it deſcended again, without being touched, to ninety.

The day after, in finer weather, the ſame branch, at eight in the morning, made an angle of one hundred and thirty-five degrees with the ſtem; after being touched, the angle was diminiſhed to eighty; an hour after, it roſe again to one hundred and thirty-five; being touched a ſecond time, it deſcended again to eighty; an hour and a half after, it had riſen to one hundred and forty-five; and upon being touched a third time, deſcended to one hundred and thirty-five, and remained in that poſition till five o'clock in the afternoon; when being touched a fourth time, it fell to one hundred and ten.

With whatever body the ſenſitive plant is touched or irritated, it is remarkable that the ſenſibility reſides particularly in the articulation or joining either of the branches of the common foot-ſtalk, or of the particular foot-ſtalk of each wing.

The time which a branch requires to recover itſelf after being touched, varies according to the vigour of the plant, the hour of the day, the ſeaſon of the year, or the heat and other circumſtances of the atmoſphere.

The order in which the parts recover themſelves, varies in like manner: ſometimes it is the common foot-ſtalk; ſometimes

ſometimes the rib to which the lobes are attached; and ſometimes the lobes themſelves are expanded, before the other parts have made any attempt to be reinſtated in their former poſition.

If, without ſhaking the other ſmaller leaves, we cut off the half of a lobe belonging to the laſt pair, at the extremity or ſummit of a wing, the leaf cut and its antagoniſt, that is to ſay, the firſt pair, begin to approach each other; then the ſecond; and ſo on ſucceſſively, till all the leſſer leaves of that wing have collapſed in like manner. Frequently, after twelve or fifteen ſeconds, the lobes of the other wings, which were not immediately affected by the ſtroke, ſhut; whilſt the ſtalk and its wing, beginning at the bottom, and proceeding in order to the top, gradually recover themſelves.

If, inſtead of one of the leſſer extreme leaves, we cut off one belonging to the pair that is next the footſtalk, its antagoniſt ſhuts, as do the other pairs ſucceſſively, from the bottom to the top.

If all the lobes of one ſide of a wing be cut off, the oppoſite lobes are not affected, but remain expanded.

With ſome addreſs it is poſſible even to cut off a branch without hurting the leaves or making them fall.

The common foot-ſtalk of the winged leaves being cut as far as three fourths of its diameter, all the parts which hang down collapſe, but quickly recover, without appearing to have ſuffered any conſiderable violence by the ſhock.

An inciſion being made into one of the principal branches, to the depth of one half the diameter, the branches ſituated betwixt the ſection and the root will fall down: thoſe above the inciſion remain as before, and the leſſer leaves continue open; but this direction is ſoon deſtroyed, by cutting off one of the lobes at the extremity, as was obſerved above.

Laſtly, a whole wing being cut off with precaution near its inſertion into the common foot-ſtalk, the other wings are not affected by it, and its own lobes do not ſhut. No motion, likewiſe, enſues from piercing the branch with a needle or other ſharp inſtrument.

From the preceding experiments, moſt of which I have myſelf

myſelf made, and from many others, which, for brevity' ſake, I forbear to mention, theſe inferences are clearly to be deduced.

I. That when the plant is in its greateſt vegetative force, its motions are greater and more ſenſible.

II. That when the ſky is ſerene, and the ſun bright during the whole day, the plant is more ſenſible in the morning than at noon.

III. That in the circumſtances in which they are leſs ſenſible, the leaves continue to fold and collapſe, although the foot-ſtalks, which through age become ſtiff and woody, have loſt their motion.

IV. That a ſtroke, or an irritation, produces a more forcible effect than an inciſion or even an entire ſection.

V. That a ſlight irritation only acts upon the neighbouring parts, and extends its influence in proportion to its force.

VI. That any given irritation acts more ſtrongly upon ſome parts than on others.

VII. That whatever can produce any effect upon the organs of animals, acts upon the ſenſitive; as a ſtroke, exceſs of heat or cold, the ſteam of boiling water, that of ſulphur and volatile ſpirits, &c.

VIII. That plunging it in water, or lodging it in the exhauſted receiver of an air-pump, ſeems to have no other effect than that of diminiſhing its vigour.

IX. That there appears to be no more intimate communication betwixt the oppoſite lobes of a winged or pinnated leaf, than betwixt the other parts of the plant.

X. That the muſcular motion of the ſenſitive plant is owing to a ſtrong contraction: each footſtalk ſeems to be terminated with a kind of joint, on which the leaves turn in all directions with ſurpriſing facility.

Different from all the kinds of ſenſitive plants yet known, is the dionæa muſcipula, a native of the Swamps of North America. The plant, which is of very long growth, and riſes with a naked ſtalk, is garniſhed at the bottom with eight or nine ſimple leaves with winged foot-ſtalks, which proceed immediately

immediately from the root. In the figure and ſenſibility of theſe leaves, conſiſts the ſingularity of the plant. Each leaf is almoſt round, *ciliated,* that is, fringed like an eye-laſh, and runs out into a foot-ſtalk, which is not, as I ſaid, of equal breadth throughout, but is gradually enlarged towards the top. Upon touching the leaves in cold weather, no ſenſible contraction enſues; in warm weather, and particularly at noon, it is very ſtrong. But what is moſt remarkable of this plant is, its rare way of deſtroying flies and other inſects which approach it. A fly no ſooner touches the middle of the upper ſurface of the leaf, than its lobes, moving as by a ſpring, cruſh the inſect to death; the *cilia,* teeth or feelers at the margin, by their inoſculations, producing ſo tight a compreſſion, as quickly to occaſion that event. No accurate trials have yet been made with reſpect to the intenſity of the contraction at different times, and the difference of aptitude in the plant to recover its former direction.

If we except the number of its ſtamina, which are ten, *Dionæa* has a conſiderable reſemblance to the plants of the genus *Droſera,* commonly called *Ros ſolis* or ſun-dew, in the leaves of the Cape ſpecies of which, the *Droſera ciſtiflora* of Linnæus, Roth, an ingenious botaniſt, obſerved a ſenſitive quality to reſide, analogous to that of *Dionæa,* though fainter. Both genera arrange under the natural order GRUINALES. An Indian ſpecies of wood-ſorrel, which belongs to the ſame natural order, poſſeſſing a like contracting faculty, is on that account termed, by ſome botaniſts, *Herba viva, Herba ſentiens, Herba mimoſa Malabarienſium,* and by Linnæus, *Oxalis ſenſitiva.*

To conclude, the cauſe of this and the other motions of plants is merely external. The motions themſelves, therefore, are not ſpontaneous, as in perfect animals, which have that cauſe dependant on their choice and will. How many imperfect animals, however, are there, ſuch as thoſe in animal and vegetable infuſions, whoſe motions, like thoſe of the plants in queſtion, are ſolely to be attributed to heat, light, and other external cauſes?—and again, how many, as the gall-inſects, the oyſter, and other ſhell-fiſh, have

have not a motion so perceptible nor rapid as that of *Dionæa muscipula*, and the sensitive plant!

The negroes in Senegal call a large species of sensitive plant, which grows in that country, gueracklao, that is, good-morrow; because, say they, when you touch it, or draw near to speak to it, the plant immediately inclines its leaves, to wish you, as it were, a good-morrow, and to shew that it is sensible of the politeness done it. In the same country, is produced a small sensitive plant, that is rampant, not spinous, and which M. Adanson affirms to be infinitely more delicate and sensible than all the other species.

A lye-water made from the ashes of the roots of Spanish carnation is reckoned proper for bringing down the catamenia. The flowers, bruised and steeped in breast-milk, are a gentle anodyne, for which purpose they are often given, in the West Indies, to quiet very young children. The leaves of this plant are used instead of senna in Barbadoes and the Leeward islands; and in Jamaica it is called senna.

The root of *polygala senega*, or senega rattle-snake root, consists of many jointed fleshy tubercles or knobs, and has been long used by the Seneka Indians, both outwardly and inwardly, as an infallible remedy for the bite of that pernicious animal, the rattle-snake. The inhabitants of Virginia have, of late years, used the same plant with considerable success in many disorders proceeding from thick sizy blood.

LURIDÆ. The name of the twenty-eighth order in Linnæus's Fragments of a Natural Method, consisting of plants whose pale and ominous appearance seems to indicate something noxious in their nature and quality.

List of the Genera *contained in this Order*.

Linnæan Genera.			English Names.
Atropa,	—	—	Deadly night-shade.
Browallia.			
Capsicum,	—	—	Guinea pepper.
Catesbæa,	—	—	Lily-thorn.
Celsia.			

Cestrum,

Linnæan Genera.			English Names.
Cestrum,	—	—	Bastard jasmine.
Datura,	—	—	Thorn-apple.
Digitalis,	—	---	Fox-glove.
Ellisia.			
Hyoscyamus,	—	—	Henbane.
Lycium,	—	—	Box-thorn.
Nicotiana,	—	—	Tobacco.
Pedalium.			
Physalis,	—	—	Alkekengi or winter-cherry.
Sesamum,	—	—	Oily purging grain.
Solanum,	—	—	Night-shade, potatoe.
Strychnus.			
Verbascum,	—	—	Mullein.

Habit and Structure of the Plants of this Order.

Most of these plants are herbaceous and perennial. Many of them are of the masqued tribe of flowers, such as fox-glove, pedalium, oily purging grain, celsia, and browallia; others resemble these in their general appearance, but differ from them essentially in the equality of their stamina.

The Roots are generally branched, sometimes tuberous.

The Stems and Branches are cylindric.

The Leaves are generally simple and placed alternate. In browallia and pedalium, the lower leaves are opposite, the upper alternate. Lily thorn and strychnus have all their leaves placed opposite.

The Flowers are hermaphrodite. They proceed either singly, or in clusters, from the angle formed by the leaves and branches. In some species of box-thorn, they terminate the branches.

The Calyx is generally of one piece deeply divided into five parts.

The Corolla consists of one petal, which is either bell, funnel, or wheel-shaped.

The Stamina are four or five in number, and those either of equal lengths, as in the greater number, or unequal,

as in fox glove, pedalium, oily purging grain, celfia, and browallia, where two of the ftamina are long and two fhort.

The SEED-BUD is placed above the receptacle of the flower. The ftyle is fingle, and terminated by a fummit, which is hemifpherical, and frequently channelled or furrowed.

The SEED-VESSEL in fuch as have equal ftamina, is a berry; in the reft, it is generally a capfule.

The SEEDS are numerous, and frequently kidney-fhaped.

Thefe plants in general have an infipid tafte, and a naufeous difagreeable fmell.

The greater part, particularly the fruits of deadly night-fhade and thorn-apple, taken internally, if in any confiderable quantity, prove mortal: caufing a ftupor, delirium, and convulfions. Thefe fatal effects, it is true, may be in a great meafure prevented by the fpeedy and copious ufe of emetics, and, perhaps, more certainly ftill, by that of acids, fuch as vinegar, or the juice of lemons adminiftered in great abundance.

Alkekengi berries are diuretic.

The external application of thefe plants is more deferving of recommendation than their internal ufe. The frefh leaves of deadly night-fhade applied to hard tumours and fchirrous fwellings on the breaft have long been efteemed as an affured remedy. The ladies in Italy make ufe of the diftilled water of this plant for beautifying their fkin, whence the name belladonna, (handfome lady,) by which it is generally known among botanifts. The painters in miniature prepare a very beautiful green colour from the macerated fruit.

Guinea-pepper grows naturally in both the Indies. It is raifed from feed in America, Spain, Portugal, Languedoc, Provence, and even in our gardens. In all the Caribbee iflands, the inhabitants ufe the pods in fauces; as do likewife the Negroes, who are very fond of them; whence this genus of plants had the appellation of Negroe and Guinea-pepper, by the former of which names it is generally known all over the Weft Indies. The feeds are intolerably acrid.

An

An ointment, made of the flowers of purple fox-glove, and May-butter, is much commended by fome phyficians for fcrophulous ulcers, which run much, and are full of matter. Taken internally, it is a violent purgative and emetic; and is, therefore, only to be adminiftered to robuft conftitutions. The country people in England frequently ufe a decoction of it with polypody of the oak, in epileptic fits. In Italy, fox-glove is efteemed an excellent vulnerary.

Thorn-apple is ufed externally in burnings, and in inflammations. Of its juice is made an ointment which is excellent for the piles.

The leaves of henbane are emollient, cooling and anodyne, good for inflammations, and defluxions of hot rheum. Ufed internally, they are a ftrong poifon. The roots are accounted narcotic, and but rarely ufed inwardly; they are frequently hung about childrens' necks, being cut to pieces, and ftrung like beads, to prevent fits, and caufe an eafy breeding of teeth. The feed, made into an electuary, with conferve of rofes, and white poppy feeds, is commended by Mr. Boyle and Hælideus, againft fpitting of blood, as well as any other hæmorrhage. A fumigation of the feeds is faid to give eafe in the tooth-ach. The juice of henbane, or the oil made by infufion with its feeds, is fpecific in pains of the ear.

Green tobacco pounded, and mixed with unflacked lime, is frequently ufed by the inhabitants of the Weft-Indies for poifoning waters abounding with cray-fifh, which, by thefe means, are eafily taken. The plant is very liable to be deftroyed at the roots, by a grub or large worm, called by the Weft-Indians, kitifonia; the leaves are likewife often deftroyed by a fmall green worm of the eruca kind.

The leaves and berries of common night-fhade, (*folanum nigrum*,) are ufed externally for inflammations and hot fwellings; as alfo for burns and fcalds.

Bitter-fweet, the *folanum dulcamara* of Linnæus, is commended for the dropfy, jaundice, and king's evil; for the former of which difeafes, common fox-glove has lately, on the authority of Dr. Withering, obtained very great, and,

as

as far as I can learn, very deſerved eſtimation. In Weſtmoreland they ſcrape the bark off the ſtalks of bitter-ſweet, and boil about an ounce of them in ale, which they give to women in childbed, to help the ſwelling of their breaſts. A decoction of the ſeeds of this plant is ſaid to be ſerviceable in venereal complaints.—The fruit of ſolanum melongena, ſometimes called the egg-plant, is often ſtiled the mad-apple, or apple of Sodom. This poiſonous fruit is frequently attacked in the eaſtern countries by an inſect, which turns all the inſide into duſt, leaving the ſkin only entire, and of a very beautiful colour.

The flowers of great white mullein, the Verbaſcum Thapſus of Linnæus, are uſed externally in inflammatory ſwellings. An infuſion of them is preſcribed internally in dyſenteries and colics occaſioned by ſharp humours. The leaves are accounted pectoral, good for coughs, ſpitting of blood, and other diſorders of the breaſt. Outwardly they are uſed like the flowers in fomentations or fumigations. They are reckoned a ſpecific againſt the piles.—In North-America, a decoction of the roots injected into the wounds of cattle which are occaſioned by worms, effectually cures them by deſtroying the inſects. Theſe worms are the *Larvæ* of the *Oeſtrus* or Gadfly, which depoſits its eggs on the back of cattle—and the Larvæ being hatched from theſe eggs, cauſe great ſores, in which they live, till they are ready for their change. In the ſouth of Ruſſia, they uſe for the ſame purpoſe the decoction of *Veratrum*, or white hellebore.—A tea is prepared from the leaves, as well as from the flowers, which is ſaid to be uſeful in the dyſentery. The Indians, it is believed, uſe the plant inſtead of tobacco, whence, in Penſylvania it has obtained the name of *Tobacco of the Savages*. The Swedes in that country, ſays Kalm, tie the leaves round their feet and arms, when they have the ague.

LUXURIANS *flos*, a luxuriant or double flower; a flower, ſome of whoſe parts are increaſed in number, to the diminution or entire excluſion of others.

The parts that are augmented or multiplied in luxuriant flowers, are the flower-cup and petals, which Linnæus conſiders as the teguments or covers of the flower; the parts

that

that are diminiſhed or entirely excluded, are the ſtamina or chives, which the ſame author denominates the male organs of generation.

Luxuriance in flowers is capable of the three following varieties.

I. A flower is ſaid to be MULTIPLIED, (*flos multiplicatus*) when the increaſe of the petals is not ſuch as to exclude all the ſtamina. In this ſenſe, flowers are properly ſaid to be double, triple, or quadruple, according to the number of multiplications of the petals.

II. A flower is ſaid to be FULL, (*flos plenus*) when, by the multiplication of the petals, all the ſtamina are excluded. Such are moſt of the double flowers that engage the attention of floriſts.

III. A flower is ſaid to be prolific, (*flos prolifer*) which produces flowers, and ſometimes leaves, from its center.

For a particular deſcription of each of theſe kinds of luxuriance in flowers, the reader is referred to the articles MULTIPLICATUS *flos*, PLENUS *flos*, and PROLIFER *flos*.

Many natural orders of plants do not in any circumſtances produce luxuriant flowers. Of this kind are the maſqued flowers of Tournefort, excepting calve's ſnout; the rough leaved, umbelliferous, ſtarry plants, and ſuch as flower at the joints, of Ray. Some umbelliferous flowers, however, are *prolific*.

The pea-bloom, or butterfly-ſhaped flowers, are rarely rendered double; ſome inſtances, however, of luxuriance, are obſerved in a ſpecies of ladies finger, coronilla, and broom.

All luxuriant flowers are vegetable monſters. Such as are perfectly full, by which I mean the greateſt degree of luxuriance, cannot be propagated by ſeeds; becauſe theſe, for want of impregnation, can never ripen. Full flowers, therefore, are very properly denominated by Linnæus, eunuchs. This higheſt degree of luxuriance is very common in carnation, lychnis, anemone, ſtock, Indian creſs, roſe, marſh marigold, ranunculus, violet, pæony, and narciſſus.

Flowers which do not exclude all the ſtamina, perfect their

their feeds. Of this kind are poppy, fennel-flower, campanula, and fome others.

Some flowers, as thofe of the water-lily, fig-marigold, and cactus, have many rows or feries of petals, without the number of ftamina being in the leaft diminifhed. Such flowers are by no means to be reckoned luxuriant in the flighteft degree.

Luxuriance in flowers is generally owing to luxuriance or excefs of nourifhment.

M.

MAS *Planta*, a male plant; a plant which upon the fame root produces male flowers only. *Vide infra.*

MASCULUS *Flos*, a male flower; a flower which contains the ftamina, reckoned by the fexualifts the male organ of generation, but not the *ftigma* or female organ.

All the plants of the clafs diœcia of Linnæus have male and female flowers upon different roots: thofe of the clafs monœcia, bear flowers of different fexes on the fame root. The plants, therefore, of the former, are only male or female: thofe of the latter are androgynous; that is, contain a mixture of both male and female flowers.

MEDULLA, the pith. *Vide* STRUCTURA *Vegetabilis.*

MEJOSTEMONES, (from μείων, lefs; and ftamen): the name of a clafs in Haller's Natural Method; confifting of plants, the number of whofe ftamina or male organs is lefs than that of the petals, or divifions of the *corolla*. The term is exemplified in fpeedwell.

MENSURA, meafure. In defcribing the parts of plants, Tournefort introduced a geometrical fcale, which many of his followers have retained. They meafured every part of the plant; and the effence of the defcription confifted in an accurate menfuration of the whole.

As the parts of plants, however, are liable to variation in no circumftance fo much as that of dimenfion, Linnæus very rarely admits any other menfuration than that arifing

from

from the reſpective length and breadth of the parts compared together. In caſes that require actual menſuration, the ſame author recommends, in lieu of Tournefort's artificial ſcale, the following natural ſcale of the human body, which he thinks is much more convenient, and equally accurate.

The ſcale in queſtion conſiſts of eleven degrees, which are as follows:

I. A hair's-breadth, or the diameter of a hair, *capillus.*

II. A line, *linea*, the breadth of the creſcent or white appearance at the root of the *finger*, (not *thumb*) meaſured from the ſkin towards the body of the nail;—a line is equal to twelve hair-breadths, and is the twelfth part of a Pariſian inch.

III. A nail, *unguis*, the length of a finger-nail;—equal to ſix lines, or half a Pariſian inch.

IV. A thumb, *pollex*, the length of the firſt or outermoſt joint of the thumb;—equal to a Pariſian inch.

V. A palm, *palmus*, the breadth of the palm, excluſive of the thumb;—equal to three Pariſian inches.

VI. A ſpan, *ſpithama*, the diſtance between the extremity of the thumb, and that of the firſt finger, when extended;—equal to ſeven Pariſian inches.

VII. A great ſpan, *dodrans*, the diſtance between the extremity of the thumb, and that of the little finger, when extended;—equal to nine inches.

VIII. A foot, *pes*, meaſuring from the elbow to the baſis of the thumb;—equal to twelve Pariſian inches.

IX. A cubit, *cubitus*, from the elbow to the extremity of the middle finger;—equal to ſeventeen inches.

X. An arm-length, *brachium*, from the arm-pit to the extremity of the middle finger;—equal to twenty-four Pariſian inches, or two feet.

XI. A fathom, *orgya*, the meaſure of the human ſtature; the diſtance between the extremities of the two middle fingers, when the arms are extended;—equal, where greateſt, to ſix feet.

METEORICI. *Vide* VIGILIÆ.

METHODUS,

METHODUS, a mode of arrangement from certain agreements or circumſtances of reſemblance; a method.

Botaniſts have diſtinguiſhed two kinds of methods in arranging vegetables; the natural and the artificial.

A natural method is that, which, in its diſtribution, retains all the natural claſſes; that is, ſuch into which no plants enter that are not connected by numerous relations, or that can be disjoined without doing a manifeſt violence to nature.

An artificial method is that whoſe claſſes are not natural, becauſe they collect together ſeveral genera of plants which are not connected by numerous relations, although they agree in the characteriſtic mark or marks, aſſigned to that particular claſs or aſſemblage to which they belong.

An artificial method is eaſier than the natural, as in the latter it is Nature, in the former the writer, who preſcribes to plants the rules and order to be obſerved in their diſtribution. Hence, likewiſe, as Nature is ever uniform, there can be only one natural method: whereas artificial methods may be multiplied almoſt *ad infinitum*, according to the ſeveral different relations under which bodies are viewed.

To form a preciſe idea of the nature and utility of vegetable arrangement, whereby only a proper eſtimate can be made of the merits and defects of particular ſyſtems, we muſt look backward, and trace method and arrangement from its firſt and ſimpleſt rudiments in botanical writings, to its more perfect ſtate under Cæſalpinus and his ſucceſſors.

Although it may be preſumed that every plant poſſeſſes virtues which are proper to it, we have not been able to aſcertain them with any degree of pre iſion, unleſs in ſeven or eight hundred ſpecies, one half only of which are uſed in medicine.

If then, in order to be an expert botaniſt, it were ſufficient to know this limited number of plants, by their names and their virtues; inſpection, repeated examination, and compariſon, would, perhaps, be the only neceſſary means for attaining ſuch knowledge. A botaniſt would acquire information in the ſame manner as a traveller does of the

 countries

countries through which he paſſes, or as a labourer learns to diſtinguiſh the few plants which come under his obſervation. It would be ſuperfluous to have recourſe to other means.

But, even with the proviſo we have mentioned, ſuch a method would have its inconveniences. It would be tedious, irkſome, and always uncertain. The reſemblance of ſeveral uſeful and wholeſome plants to ſuch as are noxious and uſeleſs; the impoſſibility of diſtinguiſhing ſuch ſimilar plants, without a diſtinct idea of each; the external agreements of ſeveral ſpecies, whoſe properties are eſſentially different; the great danger of committing miſtakes; and the ill conſequences of ſuch miſtakes: theſe, and other circumſtances, concurred to ſuggeſt the neceſſity of having recourſe to diviſions determined by accurate and diſtinct characters.

The neceſſity of diviſions becomes ſtill ſtronger, if we extend our views, and, not ſatisfied with the few medicinal plants which our own country affords, embrace the whole of vegetable nature. Here memory muſt unavoidably ſink under the mighty load, if obſervation, reaſoning, and method, did not bring it timely aſſiſtance.

By obſervation, we diſtinguiſh the external marks or characters which are obvious in the appearance of natural bodies: by reaſoning, we determine the relations which ſubſiſt betwixt them: and by method, we collect, under one head, ſimilar bodies, and ſeparate ſuch as differ. Hence ariſe diviſions and ſubdiviſions, which the mind ſeizes with avidity, and retains ever after.

Thus it is, that the ſtudy of plants, which at firſt ſeems, and for a long time actually was, a ſimple nomenclature, becomes a ſcience; and this ſcience is called botany. Agreeably to this idea, Boerhaave defines botany to be a part of natural knowledge, by means of which, plants are moſt certainly and eaſily known, and engraved on the memory.

It was not, however, till after many ages, and much obſervation, that botany began to be conſidered in this philoſophical view: though diviſions of a certain kind have always been admitted, in order to facilitate the knowledge of plants.

Thus

Thus, vegetables have been ſucceſſively diſtinguiſhed from the place of growth, into aquatic, marine, wild, and domeſtic; from the time of flowering, into ſpring, ſummer, autumnal, and winter plants; ſometimes too, leſs philoſophically ſtill, they have been arranged by the names of the authors who firſt diſcovered or deſcribed them; and not ſeldom, according to the letters of the alphabet.

Theophraſtus, the ſcholar of Ariſtotle, arranges plants, from their qualities and uſes, into eſculent grains, ſucculent plants, and pot-herbs; Dioſcorides, into aromatic, alimentary, medicinal and vinous plants.

Theſe philoſophers, ſtudious to render botany uſeful, were ignorant of the means to facilitate its knowledge. Their vague and uncertain diviſions can, at beſt, aſſiſt *his* memory, who already knows the plants they deſcribe, but will never conduct to the knowledge of them. They ſuppoſe every thing; they teach nothing.

The ſame may be affirmed of all the diviſions or methods founded ſolely on the qualities or medicinal virtues of plants. Theſe methods, generally adopted by phyſicians, with a view to confine the ſcience to its true objects, have always the contrary effect, by confounding things which ought to be diſtinguiſhed.

Three reaſons, according to M. Adanſon, concur to render every ſuch method uncertain and dangerous.

I. The ſame plant has often ſeveral different virtues.

II. The different parts of a plant have often different, and even oppoſite virtues; ſo that, according to the rules of ſtrict arrangement, the root ſhould be placed in one diviſion, the flower in another, and the leaf in a third. Thus in buckthorn, and diſtaff-tree, the leaves are aſtringent, the fruits purgative. In rhubarb, monk's rhubarb, and common knot-graſs, the roots are purgative, the leaves and ſeeds binding.

III. Several plants, characterized by a particular virtue, poſſeſs it to ſuch a degree of ſtrength or weakneſs, that we may reaſonably expect very different effects from this difference of intenſity in the ſame quality. Thus in the natural

 family

family of lipped flowers, the aromatic virtue which is common to the whole tribe is poſſeſſed in the higheſt degree by roſemary, ſage, mint, marjoram, balm, and hyſſop; in a leſs degree, by germander, and ſelf-heal: and becomes almoſt inſenſible in ſage-tree and baſe hore-hound. It is the ſame with other qualities; tinctures, for example. Thus the roots of moſt of the pea-bloom tribe, and ſtarry plants, (*ſtellatæ*) afford a dye or tincture more or leſs lively; in the ſame manner, a coloured juice, which is more or leſs vivid, is procured from the leaves and flowers of that numerous tribe of plants called compound. The knowledge of this common quality, however, is ſo far uſeful, that on the diſcovery of a new plant in any particular family, we are led by analogy to explore thoſe properties in it which are known to be poſſeſſed by the family to which it belongs.—It was on this principle that M. Adanſon drew from a ſpecies of indigo at Senegal, which had eſcaped obſervation, a fecula of an azure blue colour, different from that of America, and perhaps ſuperior in beauty.

From theſe obſervations, which are furniſhed by experience, it follows as a corollary, that the principal virtue of any plant is that which is found to be poſſeſſed in common by all the plants of the family to which it belongs; and that, although the virtue in queſtion ſhould not be moſt predominant in a particular ſpecies. It is for this reaſon that the family of the purſlanes may be regarded, in a particular manner, as cordial; for although many of that tribe are likewiſe aſtringent, yet the former is the prevailing or general virtue.

Upon the whole, diviſions drawn from the virtues of plants, far from enlightening botany, plunge it anew into a chaos of confuſion and ignorance. We allow them their uſe in the *materia medica*, where plants are diſtinguiſhed by their ſenſible qualities, into bitter, acid, ſalt, ſweet, and acrid; and by their virtues, into purgative, aperient, ſudorific, hepatic, &c. But this is not botany; it is the *materia medica*: the one conducts to the knowledge of plants; the other indicates their uſe; the firſt ought, conſequently, to

to

to precede and direct the second; but cannot itself be enlightened, without divisions founded upon signs more determinate in their nature, more constant, and sensible to the eyes of the observer.

In the progress of the science, botanists have endeavoured to distinguish these signs, to fix their characters, and ascertain their relations. The most apparent would, doubtless, first attract regard; such are the size and duration of plants; circumstances from whence arose the first distinction of vegetables into herbs and trees: that is, into plants of a tender succulent nature, which lose their stems during the winter; and into such as are of a solid consistence, woody, and whose stems subsist during the winter. See ARBOR, where this distinction, as likewise that of shrubs and undershrubs, is particularly discussed.

Ancient, however, as this distinction is, and numerous as are the authors who have adopted it, it can be of very little assistance alone in determining plants with precision; as we must wait at least a full year to be ascertained of the duration of a particular plant. Some annuals, too, have a woody sort of stem, which may cause them to be mistaken for shrubs; nay more, some plants, which in a warm climate are shrubby, become herbaceous, and even annual, (as the *ricinus* or *palma christi*,) when removed into a cold one.

The same insufficiency to serve as foundations of a method will be found in the roots, and still more in all the variable qualities of vegetables, such as taste, colour, and smell, which are modified in a thousand different shapes, by culture and climate.

The leaves being earlier, more apparent, more common, and more permanent than the flowers, sooner engaged attention: but in proportion as botany made advances, the uncertainty of characteristic marks drawn from the leaves manifestly appeared. In the course of these advances, it has been found that the leaves vary in their forms, even on the same individual; that the same plant, under a different climate, with different management, or sown at different seasons, shall be covered with leaves which have not the smallest re-

 semblance

ſemblance to each other; that plants otherwiſe extremely ſimilar in their appearance, have leaves abſolutely diſſimilar; and that others, whoſe figure, qualities, and habit, differ eſſentially, are ſo remarkably ſimilar in their leaves, that confuſion muſt be unavoidable, if the characters of the leaves are made the foundation of primary diviſions. Thus a ſpecies of veronica or ſpeedwell bears the leaves of the germander; which, in like manner, bears thoſe of the oak.

Notwithſtanding theſe diſcouraging circumſtances, a ſyſtem of plants founded upon the leaves has been attempted by two ingenious moderns, both Frenchmen; M. Sauvage, in a work entitled *Methode pour connoitre les Plantes par les Feuilles*; and M. Duhamel du Monceau, in his *Traité des Arbres*. Theſe gentlemen do not, however, mean to fix preciſe characters from the leaves; their ſole intention is to preſent us with new relations, and thereby facilitate the diſtinctions which they ſuppoſe determined by means more certain and methodical. They have even ſet out with declaring the inſufficiency of the leaves for this purpoſe.

Methods having hitherto been attempted to be erected without ſucceſs, occaſioned by the inſufficiency of the leading characters, men had recourſe to ſuch as were more ſolid, more conſtant, and more general. Theſe were named natural characters, and are drawn from the habit or general appearance of the plant; and from the combination of the moſt eſſential parts of vegetation, the flower, fruit, ſeed, diſpoſition of the ſtem, and branches, &c. All the accidents of each of theſe parts, viewed and compared together, led to natural and determinate diviſions.

Theſe diviſions, founded upon numerous, permanent, and ſenſible relations, are called natural orders, or natural families. Such are the graſſes; the croſs-ſhaped, umbelliferous, liliaceous, pea-bloom, and lipped-flowers. Each plant in every one of theſe natural families collects ſenſible characters, which are eſſentially the ſame in all the plants of the family to which it belongs.

The families alluded to ſeem to have been truly diſtinguiſhed by nature; and botaniſts have ſucceſſively determined a

great

great number of them. If they had been able to arrange, in like manner, all the ſpecies of known plants, they would have diſcovered a natural method, the great *deſideratum* in botany, and which has in vain engaged the attention and reſearches of every naturaliſt ſince the origin of the ſcience.

Such a natural method would be a kind of table, exhibiting the gradual progreſſion which nature has obſerved in the formation of vegetables, as in that of all other beings. Many of the intermediate ſteps of this progreſſion; ſeveral links in the great chain, are not known. A great number of plants cannot find a place in the natural families; devoid of uniform relations betwixt themſelves, they cannot conſtitute new families; they remain, in ſome ſort, ſolitary; and would again involve the ſcience in confuſion, if Art had not ſupplied what Nature refuſed to grant.

Artificial methods were invented; and characters eſtabliſhed, which, although leſs ſenſible, and leſs numerous than the natural characters juſt mentioned, were ſimpler, more general, and equally invariable.

Upon theſe general characters, ſcrupulouſly obſerved, and minutely examined, primary diviſions have been founded, which are again ſubdivided from an attention to other characters leſs apparent.

Theſe diviſions, which form a kind of ſcale or progreſſion, are characterized by different names; as claſſes or families; orders or ſections; genera; ſpecies; varieties; and the individual; and all together conſtitute what is called a METHOD; and, when the principles upon which the diviſions proceed, are fixed and determined,—a SYSTEM.

As this ſubject is of the utmoſt importance to the beginning botaniſt, I muſt beg leave to dwell upon it, and to trace the order of bodies into genera, ſpecies, varieties, and individuals, both in the inveſtigation and the enunciation of truth; that thence the general laws of method may be eſtabliſhed.

Every natural body differs ſo from all others which are expoſed to our ſenſes, that it may be conſidered as ſingular

or individual. Thus a dog, a ſparrow, a fly, a tulip, a diamond, nitre, are all bodies which may be conſidered in themſelves, and without relation to others, as often as they ſolicit the ſenſes.

Many individuals of the ſame kind give an idea both of ſimilitude and plurality. The ſimilitude, therefore, of ſeveral individuals conſtitutes a SPECIES OR KIND,—an abſtract or general term, to which all theſe individuals, on account of their agreement in certain characters, may be referred.

But two bodies are never obſerved of ſimilar properties in every reſpect; and, therefore, the idea of a ſpecies would never ariſe, were not certain characters diſtinguiſhed from others, the eſſential from the merely accidental. The eſſential characters never vary in the ſame ſpecies; the accidental ſometimes vary in the ſame ſpecies, from certain acceſſory cauſes, which are not always and neceſſarily preſent in a natural body. Theſe accidental characters give riſe to the varieties, which are not, by any means, to be confounded with the ſpecies. Thus of the ſpecies of dogs, different breeds, as the greyhound, ſpaniel, and beagle, conſtitute the varieties; all together make up the ſpecies of that animal. In the ſame manner, difference of colour, magnitude, ſcent, taſte, and other attributes, exhibits varieties in the different ſpecies of vegetables.

In a number of ſpecies accurately diſtinguiſhed, ſome ſimilar characters are found: theſe beget the idea of a GENUS or RACE, a general term, expreſſing a ſimilitude of ſpecies, from an agreement in ſome characters. Thus, to take an example from botany. Of various plants, which, in ſpring, are ſeen in our meadows, and are conſidered as different ſpecies, from the appearance of their leaves, which are either differently cut, or of different figures, if intire; the petals are of an equal number, (five) the ſtamina and ſtyles numerous, and at the claw or bottom of each petal is a ſmall prominence or pore. Theſe reſemblances in the parts of the flower, in ſuch a number of different ſpecies, conſtitute a GENUS, which in the inſtance I have been giving, called *genus ranunculi*: and all plants which agree in

in the charaсters juſt mentioned are referred to that genus.

Similitude admits of almoſt innumerable degrees. Accordingly, orders and claſſes, higher degrees ſtill, are conſtituted from genera, by attending to the agreements of a number of genera in the firſt caſe, and of a number of orders in the ſecond. Theſe diviſions, however, are altogether arbitrary, according to the points of reſemblance under which we conſider bodies.

From what has been ſaid, it is clear how natural things are to be inveſtigated, and how communicated. The diſcoverers of natural things evidently proceeded from the conſideration of individuals to that of ſpecies and genera, and ſo on to the higher arbitrary diviſions: and a like method do all adopt who would improve natural knowledge by further diſcoveries.

But when invented and propoſed to be communicated to others, we take a different method, and beginning with the higher arbitrary diviſions, as claſſes and orders, deſcend to genera, ſpecies and varieties, in a direction retrograde to what we followed in invention. This method is found moſt adapted to the capacity of learners.

This general idea of the diviſions admitted into artificial methods or ſyſtems, will be better underſtood by the application which we intend to make of it to particular methods. At preſent I would obſerve with Cæſalpinus, that, "by means of theſe diſtinctions, the vegetable kingdom is divided like a large body of troops. The army is divided into regiments; the regiments into battalions; the battalions into companies; the companies into ſoldiers." Vegetables are ranged in claſſes, which are divided into orders; the orders conſiſt of genera; the genera of ſpecies; and, as the term regiment is an aggregate of ſoldiers, ſo the term claſs, or, to go higher ſtill, ſyſtem, is nothing elſe than an aggregate of ſpecies.

To be convinced of the great utility of artificial methods in conducting to the knowledge of plants, let us ſuppoſe the number of known ſpecies of plants to be twelve thouſand,

ſand, and the number of claſſes in a certain known method to be twenty-four. A plant is preſented to me which I never ſaw. I immediately look for the general character which ſerves to diſtinguiſh each of the twenty-four claſſes. This being found, and conſequently the claſs of the plant being determined, I have no longer to look for my plant among twelve thouſand, but, on a ſuppoſition that each claſs contains an equal number of genera, among five hundred only, the twenty-fourth part of the number juſt ſuppoſed. I next look for the character of the order, the ſecond diviſion, which being likewiſe found, will reduce this number to about an hundred. The character of the genus, which I next explore, will reduce this ſtill further, to twenty, for inſtance: that of the ſpecies determines the plant in queſtion.

This method of proceeding is ſimilar to that which is obſerved in turning over a dictionary, where, in ſearching for a word, as SPACE, we firſt look for the letter S, next P, then A, and ſo ſucceſſively the C and E. S may repreſent the claſs; P the order; A the genus; C the ſpecies, and E the variety.

It was long, however, before artificial methods attained that degree of accuracy, which we have been deſcribing. The determination of the general and particular characters which conſtitute ſuch methods, required obſervations ſo much more exact and numerous, as their principal merit conſiſts in collecting the greateſt poſſible number of natural families; as they muſt at the ſame time agree with all known plants: and, as botany, ſince the diſcovery of the new world, has more than doubled its former riches.

Lobelius in 1570; Cluſius, in 1576, and Dalechamp, a phyſician of Lyons, in 1587, gave ſucceſſively very good deſcriptions of a large number of plants, but were greatly puzzled in determining what parts were moſt proper for furniſhing claſſic and generic characters. Geſner was the firſt who ſuggeſted the propriety of the parts of fructification for this purpoſe; and Cæſalpinus, a phyſician of Piſa, firſt arranged plants according to Geſner's idea, and began the period of Syſtematic Botany.

In

In 1583, he deſcribed eight hundred and forty plants, and divided them into fifteen claſſes, by a method, in which, after admitting the general diſtinction formerly mentioned, of herbs and trees, he draws his diſtinctive characters from the parts of fructification, particularly from the ſeed-veſſel; the number of cells; the number, form, and diſpoſition of the ſeeds; the ſituation of the radicle in the ſeed; and other circumſtances. Theſe fifteen claſſes are ſubdivided into forty-ſeven ſections or orders, from an attention to the diſpoſition, ſituation and figure of the flowers; the ſituation of the radicle or embryo-plant in the ſeed; the number of lobes or ſeed-leaves; the fruit or ſeed-veſſel; the colour of the flowers; the form of the leaves and roots, and ſome other circumſtances. Cæſalpinus's method then is not founded ſolely upon the fruit, as has been imagined, but combines with ſeveral other parts of fructification, various modifications of parts, which, like the root and leaves, are connected neither with the flower nor fruit. The ſituation of the radicle or embryo-plant in the ſeed, as likewiſe the number of lobes or ſeed-leaves, are ſaid to have been firſt obſerved and accurately diſtinguiſhed by this author.

The ſame botaniſt diſtinguiſhed with great accuracy the cells and partitions of ſeed-veſſels. He made no methodical diſtinction of genera; each ſpecies being deſcribed as a diſtinct genus.

Contemporary with Cæſalpinus flouriſhed Acoſta, a Spaniard; Camerarius, a German; Porta and Proſper Alpinus, both Italians. The latter wrote an excellent treatiſe on the plants of Egypt; as likewiſe two ſeparate diſſertations on rhubarb and balſam.

Porta, in 1588, publiſhed a work, entitled, Phytognomica, or the Aſtrology of plants. In this motley collection, vegetables are divided into ſeven claſſes, from their place of growth, their reſemblances and relations to men and animals, and their relations with the ſtars. Theſe claſſes are ſubdivided into forty-ſeven ſections.

According to Porta, plants, which have any of their parts like

like a liver, are proper for the difeafes of the liver; fuch as refemble eyes, are good for the eyes; and fo of others.

This idea, fays a French writer, and the method founded upon it, is very ingenious; and contains, at leaft, as many truths as falfehoods.

In 1592, Fabius Columna, a Neapolitan, improved upon the diftribution of the genera, and invented moft of the terms now ufed for denominating the parts of fructification. His engravings on copper are efteemed excellent.

Columna publifhed his Phytobafanus, at Naples, in 1594, with thirty-five figures. The firft part of his "Ecphrafis minus cognitarum ftirpium" was publifhed in quarto, at Rome, in 1610, with one hundred and fifty-fix figures; and the fecond part at the fame place in 1616, with forty-three figures. This author is faid to have been drawn into the ftudy of botany, by fome experiments on Valerian to cure himfelf of the epilepfy. He followed no particular method, but treated of plants hiftorically, or without order.

In 1596, Cafpar Bauhin, a Swifs, fixed, with indefatigable labour, in his Pinax, the name of every plant then known and defcribed; and in 1650, his brother, John Bauhin, wrote his Univerfal Hiftory of Plants, in three volumes folio. In this work are defcribed five thoufand two hundred and fixty-fix plants, divided, not very methodically, it muft be allowed, into forty claffes. To this "par nobile fratrum" is botany indebted for a confiderable part of its progrefs; yet the rage, which ftill fubfifted of forming divifions from the virtues and ufes of plants, greatly retarded the introduction of thofe orthodox methods, as Linnæus terms them, which alone can bring the fcience to perfection.

In this period of botany, gardens were erected at the public expence, and opened for the convenience of fuch as addicted themfelves to the ftudy of plants; a circumftance which greatly accelerated the progrefs of the fcience.

The

The firſt botanical garden was opened at Padua in 1540, by the family of the Medici.

That at Bologna and Piſa in 1547.

That at Montpelier in 1598.

That at Paris in 1626.

That at Edinburgh, in 1675, by Sir Andrew Balfour, preſident of the Royal College of Phyſicians.

That at Upſal, in Sweden, in 1657.

That at Oxford in 1683.

That at Leyden in 1677.

That at Amſterdam in 1682.

That at Utrecht in 1725.

Beſides theſe and many other academical and public gardens which might be enumerated, there were three erected in Italy, one in France, one in England, five in the Low-Countries, eight in Germany, and two in Sweden by private gentlemen.

In 1680, Robert Moriſon, a native of Aberdeen in Scotland, publiſhed at Oxford, an Univerſal Hiſtory of Plants, in which he retains, under a new form, the diviſions of Cæſalpinus, founded upon the parts of fructification, particularly the fruit.

Moriſon was long an exile in France, where he applied himſelf to botany, and other branches of phyſic, and was appointed ſuperintendant of the gardens at Orleans.

Upon the reſtoration of Charles the Second, he was invited over to England by that monarch, who appointed him Regius Profeſſor of Botany at Oxford.

The Hiſtory of plants was completed by Mr. James Bobart, after Moriſon's death, and publiſhed in folio, in 1699, with one hundred and ninety-five figures on copper.

Moriſon's Method, ſays Mr. Adanſon, although not very elaborate, is extremely difficult in practice, and has not, on that account, been followed by any author, except Bobart, who completed his large work on plants, and the anonymous author of a work publiſhed in octavo, at Oxford, in 1720, under the title of "Hiſtoriæ Naturalis Sciagraphia." His

arrangement

arrangement of the umbelliferous plants is very ingenious, and has been followed by moſt ſucceeding authors.

John Ray, or Wray, was born near Braintree in Eſſex, in 1628, and early applied himſelf to the ſtudy of natural hiſtory. In his Natural Method of Plants, publiſhed in 1682, he ſuggeſted an idea or plan of arrangement, much ſuperior to that of either Cæſalpinus or Moriſon, and, perhaps, in many reſpects, inferior to none of the boaſted methods that have appeared ſince his time. This plan Mr. Ray did not execute till 1686, when he publiſhed his General Hiſtory of Plants, in which are deſcribed eighteen thouſand ſix hundred and fifty-five ſpecies, including varieties. His method is founded upon the general habit or ſtructure of plants; their ſize and duration, as herbs and trees; their greater or leſs degree of perfection; the place of growth; the number of ſeed-leaves, petals, capſules, and ſeeds; the ſituation and diſpoſition of the flowers; the form of the leaves; the abſence or preſence of the flower-cup and petals; the ſubſtance of the leaves and fruit; and the difficulty of arranging and claſſing certain plants. From a combination of theſe circumſtances, Ray has arranged all vegetables into thirty-three claſſes, which are ſubdivided into one hundred and twenty-five ſections. His method is extremely elaborate, and collects more natural claſſes than any artificial ſyſtem I am acquainted with; it is, however, extremely difficult in practice, and, therefore, now ſtudied more for curioſity than uſe. It would have ſucceeded better, ſays M. Adanſon, if Ray had been as great a botaniſt, as he was a learned writer, and judicious compiler.

In 1700 Ray publiſhed an edition of his method, augmented and corrected after that of Tournefort, which had appeared in 1694. Some pretenders to botany, envious of the ſucceſs which theſe great men had juſtly obtained, endeavoured to embroil them, though without effect; for it appears that they always lived in the ſtricteſt intimacy and friendſhip.

Ray's method was followed in 1707 by Sir Hans Sloane, in his Hiſtory of Jamaica.

In 1713, by Petiver, in his "Herbarium Britannicum."

In 1724, by Dillenius, in his enlarged edition of Ray's "Synopſis Stirpium Britannicarum."

In 1727, by Martyn, in his "Methodus Plantarum circa Cantabrigiam."

Chriſtopher Knaut, in his Enumeration of the Plants which grow round Hal, in Saxony, publiſhed in 1687, invented a method, eſtabliſhed, in part, upon the fruit, which differs but little from that of Ray. It is exceedingly complex and difficult.

Paul Hermannus, Profeſſor at Leyden, Magnolius, Profeſſor at Montpelier, and Rivinus, Profeſſor at Leipſick, ſucceſſively enriched botany with ingenious methods and new obſervations;—the dawn of the day, which the illuſtrious Pitton de Tournefort was about to diffuſe over every branch of the ſcience.

This great reformer of botany was born at Aix, in France, in 1656. He was early deſigned for the church, but, upon the death of his father, he quitted all thoughts of embracing that profeſſion; and, about two or three years thereafter, went to Montpelier, where, along with botany, he ſtudied anatomy, and other branches of phyſic, with great diligence.

In 1694, he publiſhed his Method, which conſiſts of twenty-two claſſes, and is founded on the regularity and figure of the petals or coloured leaves of the flower. The perſpicuity and preciſion of this method, gave it deſervedly, from its firſt appearance, the preference above all which had preceded it.

By the acknowledgement of all botaniſts, Tournefort has introduced into the ſcience, order, purity, and preciſion, by delivering the beſt and moſt certain principles for eſtabliſhing the genera and ſpecies; and by founding on thoſe principles the moſt accurate, and, if we except that of Rivinus, the eaſieſt method which has yet appeared. His object was not, as he himſelf declares, to eſtabliſh an univerſal method, a thing which he conſidered as impoſſible to be erected upon hypothetical and arbitrary principles; but to trace that method which appeared to him moſt

moſt convenient for obtaining an eaſy and accurate knowledge of vegetables. His twenty-two claſſes, which, by the way, might have been reduced to ſeventeen, are ſubdivided into ſix hundred and ninety-eight genera, which are again ſubdivided into ten thouſand one hundred and forty-ſix ſpecies and varieties.

Upwards of twenty authors of eminence have ſucceſſively adopted Tournefort's method, after making the alterations, which new diſcoveries, and the correction of trivial errors, rendered neceſſary. A liſt of the moſt noted of theſe authors is given under the article COROLLISTÆ, which ſee.

The facility of acquiring Tournefort's Method had procured it an almoſt univerſal reception, when Linnæus propoſed his Sexual Syſtem, and, aſſiſted by the works of his predeceſſors, and much obſervation of his own, eſtabliſhed, by indefatigable labour, a method, which has ſince attracted the attention of the learned all over Europe.

Charles Von Linné was the ſon of a clergyman in Smolandia, a province of Sweden. He applied himſelf very early to the ſtudy of Natural Hiſtory, and made ſuch progreſs, that before he reached his twenty-third year, he was judged capable of aſſiſting Rudbeckius, Profeſſor of Botany at Upſal, in teaching his claſs.

In 1731, he introduced his method, then in embryo, into the garden at Upſal, with ſucceſs. After this he was employed by the Upſal ſociety to travel through Lapland, Norway, and other northern parts of Europe, in queſt of plants, and other natural curioſities. In 1735, he travelled through Denmark, Sweden, Germany, England, and Holland, with the ſame view; and publiſhed his "Syſtema Naturæ," at Leyden, in the ſame year.

In 1736, he publiſhed his "Fundamenta Botanica," which contain the rudiments of his method; theſe he afterwards enlarged, and publiſhed under the title of "Philoſophia Botanica." When Linnæus was in London, he propoſed his method to Sir Hans Sloane, Preſident of the Royal Society, who rejected it.

In 1742, Linnæus was choſen Profeſſor of Botany at Upſal. He

He was afterwards appointed Chief Phyfician to the King of Sweden, knighted, and ennobled. The idea upon which Linnæus's method is founded, is as old as the time of Theophraftus, and fuppofes that in plants, as in animals, generation is accomplifhed by the concourfe of the two fexes. The ftamina or chives he confiders as the male organ of generation; the piftillum or pointal as the female. From the number, fituation, proportion, union, and abfence of the ftamina are formed his primary divifions or claffes; and from the number and other circumftances of the pointal or female part, arife moft of the fecondary divifions or orders.

Such is the general idea upon which the celebrated Sexual Syftem of Linnæus proceeds. A particular delineation or analyfis of it is prefixed to this work; and a juft eftimate of its merits and defects may be obtained by a careful perufal of the criticifms on his feveral claffes, to be found in the prefent work, and an exact comparifon of thofe claffes with the primary divifions of other Syftematic writers, Ray and Tournefort in particular.

The authors who have followed Linnæus's Sexual Method are,

In 1739, Gronovius in his Flora Virginica.

In 1755, the fame author in his Flora Orientalis Rauwolfij.

In 1756, Brown in his Natural Hiftory of Jamaica.

In 1762, Mr. Jacquin in his Enumeratio Plantarum Americanarum.

In the fame year, Mr. Hudfon, apothecary, in London, in his Flora Anglica. In this ufeful book, Mr. Hudfon gives the generic and fpecific characters of every known plant that is native in England; the time of flowering; the Englifh name; the place of growth; and its duration, whether annual, biennial, perennial, woody, or herbaceous.

The Sexual Method, when firft propofed by its author, gained little approbation. This was certainly owing to the great reputation which Tournefort's had obtained, and which nothing but the conviction of fuperior ingenuity, merit and

 induftry,

induſtry, could poſſibly diminiſh. Without entering, at preſent, into a detail of the reſpective merits of theſe two illuſtrious botaniſts, let us endeavour to derive inſtruction from the diverſity of their principles and methods.

The order of nature is alone without imperfection; an order, however, which we have not yet been able to detect. Every artificial method has neceſſarily its defects, and its obſcurities. But two methods, ſuch as thoſe of Tournefort and Linnæus, ſo well conceived, ſo judiciouſly executed, and founded upon obſervation, muſt enlighten each other mutually. They cannot err on the ſame ſubject; if the one wanders but for a moment, the other immediately ſets him in the right path.

The ſame reflection occurs in comparing ſeveral other learned and ingenious methods; ſuch as thoſe of Haller, Van Royen, Sauvages, Ludwig, Adanſon and Duhamel; and the obſervations ſcattered through the works of Juſſieu, Guettard, Dillenius, Louis Gerard and others; ſo certain is the maxim with which I ſhall conclude this article, that a multiplicity of methods and obſervations compared together, leads us to diſtinguiſh plants under a greater number of relations, and conſequently conducts us, with greater eaſe, to their knowledge.

MISCELLANEÆ. The name of the fifty-fourth order in Linnæus's Fragments of a Natural Method, conſiſting of the following plants, which not being connected together by numerous relations in their habit and ſtructure as the natural families, are aſſembled into one head, under the title of Miſcellaneous Plants. Such of them as ſeem moſt nearly connected, we have placed together, and diſtinguiſhed from the others by a letter of the Greek alphabet; a method which we ſhall obſerve on other ſimilar occaſions.

	Linnæan Genera.	English Names.
α	*Datiſca,* — —	Baſtard hemp.
	Reſeda, — —	Baſtard-rocket, dyer's-weed.
β	*Poterium,* — —	Garden-burnet.
	Sanguiſorba, —	Greater wild-burnet.

γ *Lemna,*

Linnæan Genera.	English Names.
γ *Lemna*, —	— Duck-meat.
Pistia, —	— Kodda-pail.
δ *Coriaria*, —	— Myrtle-leaved sumach.
Empetrum, —	— Black-berried heath, or crow-berries.
ε *Achyranthes*,	— Cadelari.
Amaranthus,	— Amaranth, or flower-gentle.
Celosia, —	— Cock's-comb.
Gomphrena, —	— Globe-amaranth.
Iresine.	
Phytolacca, —	— American night-shade.
ζ *Nymphæa*, —	— Water-lily.
Sarracenia, —	— Side-saddle flower.
η *Cedrela*, —	— Barbadoes cedar.
Swietenia, —	— Mahogany.
θ *Corrigiola*.	
Limeum.	
Telephium, —	— True orpine.

Dyer's weed, or wild woad, by some called weld, is chiefly esteemed by the dyers for its fine yellow colour. In medicine it is little used; yet the root is esteemed aperient, and sometimes given in decoction, and the juice of the plant promotes perspiration. This is now generally believed to be the plant with which the Picts, the ancient inhabitants of Britain, painted their bodies; the rather, as the plant in question is a native of this island; whereas woad, (Isatis of Linnæus) the plant contended for by some, has been introduced into Britain since that time.

The flowers of Egyptian reseda, termed likewise, mignionette of Egypt, have a very sweet, agreeable smell.

Burnet is of a heating, drying nature, cordial and alexipharmic; in summer the leaves are used in cool tankard, to give the wine an agreeable flavour. The powder of the root is commended against spitting of blood, bleeding at the nose, dysenteries, and diseases attended with violent secretions.

tions. In winter and ſpring, the young tender leaves are uſed in ſallads. Greater wild burnet, ſtript of its bark, is ſometimes applied with ſucceſs to recent wounds; the dried powder ſtops the progreſs of cancerous ulcers.

Myrtle-leaved ſumach is much uſed in the South of France, where it naturally grows, for tanning of leather, whence it has been termed by ſome, tanner's ſumach. The ſame plant dyes a beautiful-black colour. The berries are dangerous, and when eaten, generally occaſion vertigoes, and epilepſies. The old leaves, when browſed upon by cattle, have the ſame effect; the young leaves have no ſuch pernicious quality.

The leaves and roots of American night-ſhade, (the *Phytolacca decandra* of Linnæus) ſometimes termed pork-phyſic, are anodyne. The juice of the root is a violent purgative, and therefore to be uſed with caution; the berries, when ripe, give a very beautiful purple-red tincture. The leaves are uſed externally in diſcuſſing painful ſwellings. In North America the inhabitants boil the young ſhoots, and eat them like ſpinach. The Vignerons in Portugal, ſays Mr. Miller, for many years made uſe of the juice of the berries of this plant for mixing with their red port wines, to which it gave a deep colour, and when a great quantity was added, a very diſagreeable taſte. A complaint of this practice having been made to his Portugueze majeſty, he commanded that the ſtems of this plant ſhould be cut down before they produced berries, to prevent the further adulteration of the wines. *Vide* MILLER'S GARDENER'S DICTIONARY, *Voce* PHYTOLACCA.

The wood of Barbadoes cedar, (*cedrela odorata,*) and of mahogany, (*Swietenia mahagoni,*) has an aromatic, balſamic, and agreeable ſmell. The former is employed in the Weſt-Indies, on account of its pliancy, for making canoes of a ſingle piece, as well as planks, and ſhingles for covering houſes, and houſehold furniture. There are canoes in theſe places, ſays Miller, formed out of the trunks of theſe trees, which are forty feet long, and ſix broad. As the worms are apt to eat the wood of the Barbadoes cedar, it is not proper

for building of ſhips, though frequently uſed both in build-ing and ſheathing veſſels. The ſame objection does not lie againſt mahogany, which is leſs liable to be attacked by worms than oak; ſo that mahogany ſhips are preferable to any other, not only for the reaſon juſt mentioned, but becauſe the wood is very durable, and buries gun-ſhot without ſplintering. The excellency of mahogany for all domeſtic uſes, is too well known in England to require any eulogiums in this place.

MODUS *florendi*, a mode of flowering. *Vide* INFLORESCENTIA.

MONADELPHIA, (from μονος, alone; and ἀδελφία, a brotherhood,) a ſingle brotherhood. The name of the ſixteenth claſs in Linnæus's Sexual Syſtem, conſiſting of plants with hermaphrodite flowers; in which all the ſtamina, or male organs of generation, are united below into one body or cylinder, through which paſſes the pointal or female organ. The particular claſſic characters of the plants in queſtion, beſides that expreſſed in the title, have been already given under the article COLUMNIFERÆ; to which natural order, moſt of the plants in the claſs *monadelphia* are referred. The principal of theſe characters are the following.

I. A permanent flower-cup, and generally double.

II. Five heart-ſhaped petals, cloſely embracing one another above, ſo as to form the appearance of a ſingle petal.

III. The *anthers*, or tops of the ſtamina, kidney-ſhaped, and ſlightly attached to the filaments by the middle.

IV. The receptacle of the fructification, or that to which the flower and fruit are attached, is prominent in the middle of the flower.

V. The ſeeds, kidney-ſhaped.

The orders of the claſs are five, from the number of united ſtamina.

Hermannia, waltheria, and melochia, have five ſtamina.

Crane's-bill, connarus, and hugonia, have ten.

Brownæa has eleven.

Pentapetes, twelve.

 Silk

Silk cotton-tree, Æthiopian four-gourd, Indian mallow, napæa, marsh-mallow, hollyhock, mallow, lavatera, bastard mallow, urena, cotton, Syrian mallow, stewartia, and camellia, have numerous stamina.

In some species of geranium or crane's bill, the stamina are distinct. In others, the filaments are alternately furnished with anthers.

A species of silk cotton tree, termed by Linnæus, *bombax pentandrum*, has only five stamina.

The genera of this class were formerly distinguished by the fruit; which being found insufficient, several botanists had recourse to the leaves as an auxiliary. Linnæus distinguishes the genera chiefly by the calyx, which is generally double in plants of the last order.

MONANDRIA, (from *μονος*, alone, and *ἀνηρ*, a man or husband); the name of the first class in Linnæus's Sexual System; consisting of plants with hermaphrodite flowers, which have only one *stamen* or male organ.

This class is subdivided, like the other plain classes in the same system, from the number of the styles or female organs, into two orders.

Indian flowering-reed, ginger, *costus*, alpinia, Indian arrow-root, turmerick, *kæmpferia*, *thalia*, American hogweed, jointed glass-wort, and hippuris, have only one style.

Tickseed, callitriche, blite, and cinna, have two styles.

MONANGIÆ, (from *μονος*, alone, and *αγγος*, a vessel); the name of the fifteenth class in Boerhaave's Method; consisting of plants with a single seed-vessel, that is not divided internally into more than one cell. It is exemplified in loose-strife, water-leaf, and pimpernel.

MONOCOTYLEDONES *Plantæ*, (from *μονος*, alone, and *cotyledon*, a lobe or seed-leaf); plants so termed, whose seeds have only one lobe, and consequently rise with a single seed-leaf. The term is opposed to *dicotyledones*, which includes plants that rise with two seed leaves.

The distinction of the lobes of the seed was first observed by Cæsalpinus, who thence denominated seeds, *univalvia*

and

and *bivalvia*. Mr. Ray afterwards employed it as a primary division in the construction of his ingenious method. *Vide* COTYLEDONES.

MONŒCIA, (from μονος, alone, and οἰκία, a house); the name of the twenty-first class in Linnæus's Sexual Method; consisting of plants which have male and female flowers placed apart, that is, within different covers, on the same root.

The plants then in the class *monœcia* are not hermaphrodite, as those of the greatest number of classes in the Sexual System; nor male and female upon different roots, as in the class *diœcia*; but androgynous; that is, consist of male and female flowers upon different parts of the same plant. *Vide* ANDROGYNA *Planta*.

In arranging the genera of a system, founded, like that of Linnæus, upon the sexes of plants, it is of the utmost consequence to pay the strictest attention to that real or supposed distinction: as by arranging several genera or species of different sexes under one class or order, the very intention of the arrangement, which is professedly to facilitate the knowledge of plants, is totally defeated. Obvious as this observation must appear, it has not always been attended to by Linnæus; who, in classing and new-modelling the genera, has frequently deviated from the principles of his plan, by confounding plants of different sexes under the same class, order, and genus.—Instances of this impropriety have been already given in the article *diœcia*.

The plants of the following list, which, in strict conformity to the rules of arrangement, ought to have been referred to the class *monœcia*, are arranged by Linnæus under classes and genera, containing hermaphrodite flowers:

Callitriche verna,
Plantago uniflora,
Rumex spinosus,
Glycine monoica,
Arum triphyllum,
Mercurialis ambigua.

The orders in this class are derived from the number, union, and

and ſituation of the ſtamina, or male organs; circumſtances which conſtitute the primary characters in the hermaphrodite claſſes of plants. They are eleven in number, and diſtinguiſhed by the ſame names with thoſe of the claſſes juſt mentioned. Thus,

Cynomorium, triple-headed pond-weed, ceratocarpus, and elaterium, have only one ſtamen, or male organ.

Anguria and duck-meat have two ſtamina.

Omphalea, cat's tail, burr-reed, Job's tears, Indian wheat, tripſacum, olyra, carex, tragia, axyris, jack-in-a-box, and ſea-ſide-laurel, have three ſtamina.

Centella, birch, box, nettle, and mulberry, have four ſtamina.

Leſſer burdock, ambroſia, parthenium, Jeſuit's-bark-tree, amaranthus, and ſolandra, have five ſtamina.

Zizania and pharus have ſix ſtamina.

Guettarda has ſeven ſtamina.

Ceratophyllum, water-milfoil, arrow-head, dog's cabbage, garden-burnet, oak, walnut, beach, horn-beam, hazel-nut, plane-tree, and ſweet gum, have ſeveral ſtamina.

Pine, arbor-vitæ, cypreſs, plukenetia, dalechampia, acalypha, baſtard ricinus, caſſava, palma-chriſti, ſand-box-tree, manchineel-tree, and ſterculia, have their ſtamina united below into a cylinder.

Serpent cucumber, male balſam-apple, gourd, cucumber, bryony and ſingle-ſeeded cucumber, have their ſtamina united above by the anthers into a cylinder.

Baſtard orpine has the ſtamina placed upon the female organ; a circumſtance which involves an abſurdity when affirmed of any plant of the claſs in queſtion; and which, if true, ſhould moſt certainly have determined the author to place the genus in the claſs *gynandria*, of which the circumſtance juſt mentioned is the ſtriking and claſſic character.

To obviate this objection, it has been obſerved by M. Gouan, that both in baſtard orpine and clutia, which latter belongs to a ſimilar order in the claſs *diœcia*, the *piſtillum*, or female organ, is entirely wanting in the male flowers: yet, as the ſtamina are inſerted into the place which the *piſtillum* would

would occupy, if the flowers were hermaphrodite, he, therefore, concludes there is no impropriety in eſtabliſhing an order from that circumſtance. To illuſtrate this, he conſiders the receptacle of the flower as divided into four concentric circles: the calyx, or flower-cup, conſtitutes the firſt or outermoſt circle; the petals occupy the ſecond; the ſtamina are placed in the third; and the *piſtillum*, or female organ, poſſeſſes the innermoſt or middle circle. Hence it follows, continues our author, that even when the ſtamina are inſerted into the inner ſide of the petals, they ſtill occupy a circle which is concentric to that of the petals, and placed without that of the pointal. The ſtamina, therefore, in ſuch circumſtances, cannot be reckoned out of their place. But if the middle circle of the receptacle, which is eſſentially deſtined for the *piſtillum*, ſhould, in the abſence even of that organ, be occupied by the ſtamina, theſe laſt are then quite out of their place, and may properly be conſidered as being attached to the *piſtillum*, when inſerted into the place which that organ, if it exiſted, would certainly occupy.

I ſhall only obſerve upon this ingenious remark of the French author, that by the ſame way of reaſoning, all the plants of the claſſes *monœcia* and *diœcia*, might be referred to the claſs *gynandria* in the Sexual Method; as in theſe claſſes the female organ is entirely wanting in the male plants, and the ſtamina occupy the centre of the receptacle.

MONOGRAPHI, (from μονος, alone, and γραφω, to write); a claſs of botanical writers ſo termed by Linnæus, who have beſtowed their attention and reſearches upon a ſingle vegetable. Of this kind is Dillenius's Treatiſe on Fig-marigold; Kæmpfer on Tea; Boerhaave on Silver-tree; Haller on Garlick, and the Mountain-ſpeedwells; Breynius and Lafitau on Ginſeng; Bradley on the Aloe; and ſeveral diſſertations of Linnæus in the *Amœnitates Academicæ*.

MONOGYNIA, (from μονος, alone, and γυνη, a woman, or wife); the name of the firſt order or ſubdiviſion in the

first thirteen classes of Linnæus's Sexual Method; consisting of plants, which, besides their agreement in the classic character generally derived from the number of stamina, have only one style or female organ.

MONOPERIANTHÆ, (from μονος, alone, περι, around, and ανθος, a flower); the name of a class in Wachendorffius's Natural Method; consisting of plants with visible flowers, which have only one of the covers; that is, want either the flower-cup or petals. It is exemplified in ladies mantle, wild orach, hellebore, meadow-rue, medeola, rhubarb, American night-shade, asarabacca, and several others.

MONOPETALOIDES *Flos.* *Vide* MULTIFIDUS *Flos.*

MONOPETALUS *Flos*, (from μονος, alone, single, and πεταλον, a leaf). *Vide* COROLLA.

MONOPETALI, the name of two classes in Rivinus's Method; consisting of plants whose flowers are composed of one petal, which, in its form, is either regular or irregular. The regular flower of one petal is exemplied in borage, bugloss, tobacco, and the bell-shaped flowers; the irregular flowers of one petal, are the lipped and masqued flowers of Tournefort, the *didynamia* of Linnæus and the Sexualists. Day-nettle, balm, mint, fox-glove, calves-snout, and marjoram, furnish examples.

MONOPHYTANTHÆ, (from μονος, alone, φυτον, a plant, and ἄνθος, a flower); the name of a class in Wachendorffius's Natural Method; consisting of plants which have male and female flowers placed apart upon the same root. It corresponds to the class *monœcia* in the Sexual System. *Vide* MONOECIA.

MORBUS, a disease. The diseases of plants, so far as they regard botany, will fall properly to be considered under the article VARIETAS, whither we refer the reader.

MOTUS, motion; when applied to plants, the term motion is very limited, and expressive not of an absolute change of place, but of direction. The following observations on this curious subject, may, perhaps, prove not unentertaining to the reader.

And first of the direction of roots and trunks. The direction

tion of the roots and ftems of plants is totally oppofite; the former either running directly downwards, or extending themfelves tranfverfely or horizontally under the furface of the earth: the latter exhibiting motions of a fimilar nature, but in a contrary direction. The direction of the root is never vertical, except in the upata or fanar of Senegal, the roots of which twifting, rife vertically upwards a foot above the furface of the earth, and are fometimes covered by the flux of the fea.

Familiar as the appearance is, naturalifts are not agreed with refpect to the caufes which determine the roots of plants to tend univerfally downwards, either in a horizontal or perpendicular direction, and the ftems, on the contrary, to mount perpendicularly or horizontally upwards. So conftant, however, are thefe oppofite directions, that a plant being taken out of the earth, and replaced in it in fuch manner that the root is uppermoft, and the ftem lowermoft; the root will quickly curve downwards, the ftem upwards, till each has refumed the direction which is proper and natural to itfelf.

All the caufes which concur in promoting the growth of plants, appear likewife to operate in determining their direction. Such are the air, the fun, light, and the moift warm vapours which arife out of the earth. The three firft feem to concur moft certainly to the direction of the ftem; air and moifture to that of the root.

If any number of plants are placed in pots in a room which only admits the light by a fingle hole, the ftems will incline or direct themfelves towards that fide. In thick forefts, the young trees always lean to the fide where the light penetrates. The new fhoots of an efpalier detach themfelves from the wall which robs them of the air, the fun, and the light. It is in queft of the fame excellent gifts of Nature, that the lateral branches of trees abandoning the direction of the ftem, fpread and extend themfelves in a direction parallel to the foil, even when planted on a declivity.

In like manner it appears, that the roots penetrate more

or lefs deeply into the ground, either in a perpendicular or horizontal direction, in proportion to their greater or lefs tendency to fearch for moifture. Thus it is a well known fact, that, in the neighbourhood of canals, ditches filled with water, and ground newly tilled, the roots of plants abandon their natural direction, and, as it were, fteer their courfe towards the fine air, rich juices, and grateful humidity which their fituation has placed within their reach.—So ftrongly indeed are the roots of plants attracted by water, that they frequently relinquifh the foil, and penetrate into the very heart of ditches and canals.

This force of extenfion appears to be greater in roots than in ftems. The branch furmounts an obftacle, by leaving its natural direction, and overtopping it. The root, on the contrary, without once going out of its way, pierces the hardeft foils, penetrates into walls, which it overturns, and even into rocks, which it burfts.

Although the natural motion of the trunk be to afcend, as was fuggefted above, yet is it forced oftentimes to defcend: for the trunk-roots growing out of fome plants near the ground, and fhrinking into it, ferve, like fo many ropes, to pluck the trunk annually lower and lower into the ground, along with them. If thefe trunk-roots break out only about the bottom of the trunk, then it gradually defcends into the earth, and is converted into a root (*Vide* BULBUS); but if the trunk is very flender, and the trunk-roots break forth all along it, then it creeps horizontally; the trunk-roots in queftion tethering it, as it trails along, to the ground, as in ftrawberry, cinquefoil, and mint.

I clofe the prefent fubject with this obfervation, that the direction of the roots and ftems of plants feems to be regulated, in a great meafure, by the vapours which they contain, but more by thofe which arife from the foil in which they grow; and, that heat, the fun, or the light, the caufes already fuggefted, appear to contribute to that direction, only in fo far as they augment or regulate the current of thefe nourifhing vapours.

Trunks are not, however, the only parts of plants which direct

direct their course towards the air and the light of the sun. There are flowers, which, quitting their perpendicular direction, present their surface directly to that luminous body, and follow its situation in its diurnal course. This sort of motion has been called by some writers, NUTATION; and the plants which are subject to it, have been termed *heliotropæ*; that is, turning with the sun. Of this kind are bastard-rocket, dyer's weed, sun-flower, turnsole, and the greatest part of the compound flowers with plain tongue-shaped petals, the *semiflosculosi* of Tournefort, the *planipetalæ* of Ray, and the *ligulati* of Linnæus. In these flowers, the disk or surface looks towards the east in the morning, the south at noon, and the west at night.

The spikes or ears of corn, which hang down by their weight, are observed, in like manner, to incline themselves towards the sun, never to the north. The stems of draba, trientalis, and a species of bastard fever-few with egg-shaped and notched leaves, incline or hang downwards during the night.

The observations of La Hire, Hales, and Bonnet, establish, that these motions are occasioned, not by any twisting in the stem, but by the dryness of the fibres, which, by being exposed to the heat of the sun, contract, and thus determine the *nutation* of the flowers and young stems. It is in this manner that moisture and dryness alternately dilate and contract the plant improperly called the rose of Jericho; an appearance which is likewise observed in the beards of oats, and in those of the capsules of crane's bill.

The direction of the leaves of several plants suffers considerable changes during the night. This is so certain, that if a botanist who is accustomed to the port or habit of plants, were to examine, in a summer-night, the plants which cover any particular meadow, he would find several which he could not recognize by that character. The same changes happen, when the moisture of the day corresponds to that of the night. The change of direction just mentioned is particularly sensible in compound leaves. During the heat of the sun in the day-time, the pinnated or winged leaves

of

of ſeveral plants, particularly thoſe of the pea-bloom or leguminous tribe, riſe vertically upwards, and form a right angle with the common foot-ſtalk; the lobes or leſſer leaves, which ſtand oppoſite, being applied cloſely together by their upper ſurface. Several ſimple leaves, particularly thoſe of *ſigeſbeckia*, and Indian mallow, (*urena*,) when their upper ſurface is expoſed to an ardent ſun, become, in like manner, concave; which demonſtrates their analogy with the winged leaves juſt mentioned. The artificial heat of a red-hot iron has the ſame effect upon both; but the plants ſuffer greatly by the experiment. M. Adanſon ſays, he has obſerved a ſimilar motion in the leaves of ſeveral ſpecies of wild orach, after ſun-ſet.

In that ſtate of the atmoſphere which generally precedes a ſtorm, and is found moſt favourable for vegetation, I mean in a cloſe, moiſt and cloudy air, the winged leaves extend themſelves along the common foot-ſtalk. The ſame appearance is obſerved in the leaves of the ſenſitive plant, when it has been kept for ſeveral days in a cellar below ground.

After ſun-ſet, and during the fall of the dew, they incline ſtill lower, hang vertically downwards, and are applied cloſely together, like the leaves of a book, by the lower ſurface under the ſtalk, with which they ſtand at right angles. The odd lobe, if there is one at the extremity of the leaf, folds itſelf up, till it has reached the firſt pair of lobes or ſmaller leaves in its neighbourhood. This motion, which Linnæus calls the SLEEP of plants, and can be produced by an artificial as well as natural dew, has been obſerved not only in compound leaves, ſuch as thoſe of the pea-bloom plants, but likewiſe in ſome ſimple leaves, particularly thoſe of balſam and baſtard fever-few.

The ſmall leaves of falſe acacia and liquorice hang downwards during the night, but are not united by the under ſurface, like the greater part of leguminous plants. Thoſe of the ſenſitive plant, *mimoſa pudica*, extend themſelves longitudinally along the common foot-ſtalk, and infold one another mutually. The ſmall lobes of ſeveral ſpecies of trefoil, lucern, and lotus, are united only by their

their fummits, and form a cavity which contains the young flowers, and fhelters them from cold and other injuries to which they are liable in the night-time. In fome fimple leaves, a fimilar appearance is obferved. Thus the upper leaves of garden orach approach during the night, unite perpendicularly, embrace the young fhoot, and do not relinquifh that pofture till the fun has diffipated the humidity of the air.

The action of the fun has a very different effect upon thefe leaves, as well as thofe of fome mallows, blites, and trefoils, which, like the flowers mentioned above, follow the direction of that body, and prefent to it their external furface or difk.

That fpecies of motion peculiar to fome flowers, which open and fhut at certain ftated times, is explained on nearly the fame principles with thofe of the winged leaves mentioned above. For particulars on this fubject, the reader is referred to the article VIGILIÆ *Plantarum*, by which term the motion in queftion is generally diftinguifhed.

The irritability, if I may fo term it, of thofe plants called fenfitive, has been fully confidered under the article LOMENTACEÆ, which fee.

The laft kind of motion obferved in plants, is elafticity; a flight irritation at the bafe of the ftamina of berberry, melon-thiftle, and little fun-flower, (*ciftus helianthemum*,) caufes a convulfive motion, or trembling in the parts; the ftamina contract, approach the pointal, and do not recover their former pofition. The flefhy fruits of balfam, fpirting cucumber, and wood-forrel, contract with violence when arrived at maturity, and dart the feeds contained within them to a confiderable diftance. Dry feed-veffels, as the capfules of moft of the ranunculus tribe, aconite, and lark-fpur, as likewife thofe of fraxinella, and the liliaceous and leguminous plants, burft open, in like manner, with a confiderable force.

To conclude, there are plants, which, far from being endued with that elafticity or fpring we have been illuftrating, have not even the faculty of refuming their former fituation, when

when, by any means, they have been made to change it. Of this kind are the flowers of a ſpecies of dragon's head of Virginia, which, on whatever ſide they are turned, diſcover not the ſmalleſt tendency to recover their former poſition.

MULTICAPSULARES, (from *multus*, many, and *capſula*, a ſpecies of ſeed-veſſel); the name of a claſs in Morriſon's, Hermannus's, and Chriſtopher Knaut's Methods; conſiſting of plants which have more dry capſules or ſeed veſſels than one. Of this kind are pæony, columbine, hellebore, aconite, lark-ſpur, and ſeveral others.

MULTIFIDUS *Flos*, (from *multus*, many, and *findo*, to cleave); a flower ſo termed by Linnæus, which conſiſts of one petal divided into ſeveral ſegments. It is ſynonymous to the *laciniatus flos* of Tournefort, and the *monopetaloides* of other authors.

MULTIPLICATUS *Flos*, a luxuriant flower, whoſe petals are multiplied ſo as to exclude a part of the ſtamina. *Vide* LUXURIANS *Flos*.

A multiplied luxuriant flower differs from a full one, the higheſt degree of luxuriance, in that the petals of the latter are ſo multiplied as to exclude all the ſtamina: whereas, thoſe of the former are only repeated or multiplied, two, three, or four times, to the excluſion of but a ſmall part of the eſſential organs.

A double flower properly ſo called, that is, a flower whoſe petals are twice repeated, is the firſt and loweſt degree of luxuriance.

A triple flower, whoſe petals are thrice repeated, is the ſecond degree of luxuriance. Examples of either degree are afforded by ſome ſpecies of campanula and thorn-apple.

Flowers of one petal are frequently multiplied, but rarely found full. *Vide* PLENUS *Flos*.

Flowers with more than one petal are ſubject to all degrees of luxuriance, from the loweſt to the higheſt. That they are ſubject to multiplication, the genus anemone furniſhes ſufficient proofs.

In ſome flowers, the multiplication is effected, not by the

the petals, but by the ſcales or diviſions of the flower-cup; ſuch inſtances, however, are rare. In a ſpecies of dianthus or pink, mentioned by Linnæus, the ſcales of the calyx are multiplied to ſuch a degree as to give the whole flower the appearance of a ſpike or ear of corn. The luxuriance of ſeveral mountain graſſes, particularly of *feſtuca ſpiculis viviparis*, is of the ſame kind, being effected by the monſtrous growth of the huſks of the calyx, which are metamorphoſed into leaves. The ſame appearance obtains in a ſpecies of willow called *ſalix roſea*, in which, both male and female organs being deſtroyed by inſects, the ſcales of the catkins are lengthened into leaves. In a ſpecies of plantain called *plantago roſea*, the floral leaves of the ſpike or head of flowers undergo a ſimilar enlargement.

In ſome plants the flower-cup is coloured; a circumſtance which not rarely miſleads inattentive obſervers, who are led to conſider ſuch an unuſual appearance as a repetition of the petals. Some ſpecies of primroſe furniſh examples of the appearance in queſtion.

All multiplied flowers are monſtrous, and are accidentally produced from ſingle ones. *Vide* VARIETAS.

MULTISILIQUÆ, (from *multus*, many, and *ſiliqua*, a ſpecies of pod); the name of the twenty-ſixth order in Linnæus's Fragments of a Natural Method; conſiſting of plants which have more ſeed-veſſels than one. From the etymology of the term, one would naturally imagine, that the ſeed-veſſels in queſtion were of that kind, called by Linnæus, *ſiliqua*, or pod: but the fact is, that not a ſingle plant of this order bears pods; the greater part having many dry capſules; and the remainder being furniſhed properly with no ſeed-veſſel, but bearing numerous diſtinct ſeeds.

On this account, Moriſon's title, *multicapſulares*, would have been more proper than the preſent; though even that would have been expreſſive of part of the plants only.

Liſt of Genera *contained in this Order.*

Linnæan Genera.	English Names.
* *Aconitum*, — —	Monks-hood, wolf's bane.

Aquilegia,

Linnæan Genera.		English Names.
Aquilegia, —	—	Columbine.
Delphinium,	—	Lark-ſpur.
Pæonia, —	—	Pæony.
β *Dictamnus*, —	—	Fraxinella, white dittany.
Peganum, —	—	Wild Syrian rue.
Ruta, —	—	Rue.
γ *Adonis*, —	—	Adonis, or bird's eye.
Caltha, —	—	Marſh-marigold.
Garidella, —	—	Fennel-flower of Crete.
Helleborus —	—	Hellebore.
Iſopyrum.		
Myoſurus, —	—	Mouſe-tail.
Nigella, —	—	Fennel-flower, or devil in a buſh.
Ranunculus, —	—	Crowfoot.
Trollius, —	—	Globe-ranunculus, or locker gowlans.
δ *Actæa*, —	—	Herb-chriſtopher, or bane-berries.
Anemone, —	—	Wind-flower, anemone.
Atragene.		
Clematis, —	—	Virgin's bower.
Thalictrum, —	—	Meadow-rue.

Habit and Structure of the Plants of this Order.

Theſe plants are moſtly perennial herbs: the ſtems of ſome are erect; others creep upon the ground, and produce roots near the origin of each leaf, as in ſome ſpecies of ranunculus; others climb, and attach themſelves to the bodies in their neighbourhood, either by the foot-ſtalk of their leaves, as virgin's bower, or by tendrils which terminate the foot-ſtalk, as atragene. The greateſt height of thoſe which riſe erect, as lark-ſpur, ſeldom exceeds eight feet. Thoſe which climb, rarely exceed fifteen or twenty feet.

The Roots are generally fleſhy. In ſome ſpecies of anemone they are hand-ſhaped; in others, as likewiſe in

ſeveral

ſeveral ſpecies of ranunculus, they are finger-ſhaped, or cylindric. In ſome ſpecies of hellebore and ranunculus, they are divided into ſpherical knobs. In ſome plants too of this order, the roots are fibrous.

The STEMS and YOUNG BRANCHES are cylindric.

The LEAVES, which are of different forms, being ſometimes ſimple and entire, ſometimes hand-ſhaped or winged, are generally alternate, except in virgin's bower and atragene, which bear oppoſite leaves.

The foot-ſtalk, which is ſometimes cylindric, ſometimes angular, is membranous, and very large at its origin, ſurrounding a great part of the ſtem from which it proceeds. In *iſopyrum*, the membrane in queſtion is terminated on each ſide by two ſmall teeth, in the form of *ſtipulæ* or ſcales. In marſh-marigold it forms a ſheath or glove, which is entire, ſhaped like a cylinder, and quite ſurrounds the ſtem.

The FLOWERS are hermaphrodite.

They proceed either ſingly from the wings of the leaves, or termination of the branches, as in pæony, globe ranunculus, marſh-marigold, mouſe-tail, fennel-flower, and ſome ſpecies of ranunculus and anemone; or terminate the branches in a ſpike, panicle or head, as in aconite, lark-ſpur, columbine, meadow-rue, and fraxinella. The flower of the winter aconite, a ſpecies of hellebore, in coming out of the earth, is folded up in a ſpiral manner upon its foot-ſtalk.

Theſe flowers are eaſily rendered double by culture. Ranunculus, anemone, pæony, monk's-hood, lark-ſpur, columbine, and fennel-flower, are well-known examples.

The CALYX or flower-cup is wanting in marſh-marigold, monk's-hood, lark ſpur, columbine, fennel-flower, meadow-rue, anemone, globe ranunculus, *iſopyrum*, hellebore, and virgin's bower; in the reſt it is compoſed generally of five pieces, which fall with the petals. The calyx of rue, peganum, and pæony, is permanent.

The PETALS are in number from four to fifteen, generally equal, and ſometimes, as in anemone, diſpoſed in two or three ſeries: five is the prevailing number.

The NECTARIUM in this order is various. In the greater

 number,

number, particularly lark ſpur and columbine, it is ſhaped like a horn or ſpur, and forms a tube at the bottom of the flower. In ranunculus it is a ſmall prominence or mellife-rous pore in the claw of each petal. In aconite, or monk's hood, it is compoſed of two long ſingular appearances like ſtyles, that are lodged within the upper petal, which reſem-bles a helmet.

The STAMINA are, in number, from five to three hundred, diſtinct, and attached, generally in ſeveral rows or ſeries, to the receptacle.

The SEED-BUDS are generally numerous. The ſtyle is frequently wanting.

The SEED-VESSEL is wanting in ranunculus, meadow-rue, adonis, atragene, virgin's bower, and anemone. In the reſt it is compoſed of ſeveral dry capſules, each contain-ing a ſingle cell.

The SEEDS are numerous, and frequently angular. In anemone, virgin's bower, and atragene, they are terminated each by a beard or hairy tail, which ſome conſider as the remains of the ſtyle.

Moſt of theſe plants are acrid, and many of them poiſonous. In general, plants that have a great number of ſtamina, are noxious in their quality. Thoſe of this order that are cau-tiouſly to be avoided on this account, are moſt ſpecies of monk's-hood, columbine, lark-ſpur, wild ſyrian-rue, herb-chriſtopher, hellebore, pæony, and virgin's-bower—Being burnt, theſe plants furniſh a fixed alkali; by diſtillation, there is drawn from them a nitrous and aluminous ſubſtance.

Rue and fraxinella have a ſtrong penetrating ſmell.—With reſpect to their virtues, they are cauſtic and purgative; iſo-pyrum is hepatic. Hellebore, according to ſome moderns, cauſes convulſions, and ſtiffens the limbs.

Since the time of Theophraſtus, moſt of the ſpecies of monk's-hood have been reckoned a deadly poiſon both to men and brutes. Dioſcorides, however, recommends the external application of common monk's-hood for pains of the eyes. The flowers of a great many ſpecies communicate their noxious quality, by being ſmelled to; and thoſe of the

ſpecies

ſpecies called napellus, being placed upon the head, occaſion a violent megrim. Of the bad qualities of theſe plants, we ſometimes avail ourſelves to get rid of vermin. A decoction of the roots deſtroys bugs; the ſame part being powdered and adminiſtered in bread, or ſome other palatable vehicle, to rats and mice, corrodes and inflames their inteſtines, and ſoon proves mortal; the juice of the plant is uſed to poiſon fleſh with, for the deſtruction of wolves, foxes, and other ravenous beaſts. The beſt antidote to the poiſon of the different monk's-hoods is ſaid to be the root of a ſpecies of the ſame genus, hence termed healthful or wholeſome monk's-hood. It is the *aconitum anthora* of Linnæus. The ſame plant is regarded as efficacious againſt bites of ſerpents and other venomous creatures. The roots have a bitter acrid taſte; the leaves are only bitter; the former are chiefly uſed in medicine, and beſides the excellent quality juſt mentioned, are ſtomachic, and promote perſpiration. The peaſants who gather the plant on the Alps and Pyrenees, uſe it with ſucceſs againſt the bite of mad dogs, and to cure the colic.

It is remarkable that the monk's-hoods with blue flowers are much more virulent than the yellow or white-flowered kinds. Miller aſſerts, from whoſe authority I know not, that the huntſmen of the wolves and other wild beaſts on the Alps dip their arrows into the juice of theſe plants, which renders the wounds made by them deadly.

Columbine is termed in Latin, *aquilegia*, from the reſemblance of its flowers to the claws of an eagle. The leaves of common or wild columbine, the ſpecies uſed in medicine, have been preſcribed in gargariſms for inflammations of the jaws and throat. The ſeeds and roots are reckoned ſucceſsful in facilitating the eruptions of the meaſles and ſmall pox.

An ointment made of the ſeeds of ſtaveſacre, a ſpecies of lark-ſpur, which grows naturally in Italy and the Levant, is ſaid to kill all kinds of lice; whence the plant is ſometime known by the name of louſewort.

The lark-ſpurs are ſo called from the horn or ſpur which

 terminates

terminates the upper petal, and is termed by Linnæus the *nectarium*. *Delphinium*, which is the Latin appellation of this genus of plants, is expreffive of the fancied refemblance of the flowers to a dolphin before they are expanded.

Pæony is faid to have derived its name from Pæon, the phyfician, who is reported to have cured Pluto, when wounded by Hercules, with this herb.

Fraxinella is fo called from the refemblance of the form of its leaves to thofe of the fraxinus or afh, from which circumftance it was denominated little afh, as the name imports. In the difpenfatories it has been long known by the title of *dictamnus*. The ftalks of this plant abound with an effential inflammable oil, efpecially in great droughts, when, on the approach of a candle or other igneous matter, the fubftance in queftion takes fire, and burns like fpirit of wine, till it is entirely exhaufted. The roots of this plant have had many virtues attributed to them, but are at prefent only known as an ingredient in feveral of our compofitions. By its bitter quality, dittany is faid to kill toads.

Rue, by its aromatic quality, is heating, cordial and fudorific; all the parts are ufed in medicine, except the roots. Wild Syrian-rue poffeffes the fame virtues in its native foil, which is Egypt, Syria, Italy, and Spain.

The leaves of ftinking black-hellebore are very acrid to the tafte, and highly purgative. Thofe of the green-flowered kind, being dried and powdered, are accounted good to kill worms in children; the former fpecies is dangerous. The country-people, however, frequently give the powder of it likewife to their children for worms: but how dangerous a medicine it is, may be underftood by the following fact, related by the ingenious Mr. Martyn. Some years ago, when the ground was covered with a deep fnow, a flock of fheep, in Ox-meadow, near Fulborn, in Cambridgefhire, finding nothing but this herb above the fnow, eat plentifully of it. They foon appeared much out of order, and moft of them died: fuch as were faved having fome oil adminiftered to them in time, which made them vomit up the pernicious herb. Some of thofe who died, being opened, were found to have the ftomach greatly inflamed. In

Weftmoreland,

Weſtmoreland, where this plant grows in great abundance, it has obtained, from its pernicious quality, the name of felon-graſs. Adanſon ſays, that a clyſter of an ounce of a decoction of its root is preferable to any other remedy in apopleċtick fits.

Mouſe-tail is ſo termed from its ſeeds, which, after the fall of the flowers, grow in ſlender ſpikes, two or three inches long, reſembling a mouſe's tail.

All the ſpecies of crowfoot are remarkably acrid; yet in ſome parts of France they eat the tuberous roots of a few ſpecies without any bad conſequences. The freſh roots of *ranunculus acris* are uſed by the peaſants as an excellent cautery for their cattle. *Ranunculus ſceleratus* is ſaid to prove mortal to ſheep which feed upon it.

The berries of herb-chriſtopher, which are of a ſhining black, and of the ſize of peaſe, are ſuppoſed to be of very noxious quality. A ſingle berry is inſtant death to poultry and other birds. The root of a ſpecies of herb-chriſtopher, a native of North-America, where it is denominated black ſnake-root, to diſtinguiſh it from common ſnake-root, is ſuppoſed to be an antidote againſt poiſon, and particularly that of the rattle ſnake.

Wood anemone with blue flowers tinged with purple, which grows naturally at Wimbledon, in Surry, and Lootonhoo, in Bedfordſhire, has its leaves frequently covered with the eggs of an inſect, whereby the plant, before the expanſion of its flowers, is frequently miſtaken for a fern.

Anemones, or wind-flowers, (ſo the Greek name imports,) were ſo called, from a ſuppoſition fooliſhly entertained by the ancients, that the flowers of theſe plants never open, except in a briſk wind.

The ſeeds of great wild climber, or traveller's joy, a ſpecies of virgin's bower, which grows naturally in the hedges in many parts of England, make a very fine appearance at the latter end of the year, when they cover the hedges with their plumes or white hairs. Theſe, from their reſemblance to beards, have occaſioned the plant to be generally known, at that ſeaſon, among the country people, by the name of old man's beard. It is very acrid to the taſte, and without

any ſmell; it is frequently uſed as a cauſtic, and for cleanſing old ulcers. The root is ſaid to be purgative.

The leaves of all the ſpecies of clematis being bruiſed, and applied to the ſkin, burn it into carbuncles, as in the plague; and, if applied to the noſtrils in a ſultry day, immediately after being cropped, will cauſe the ſame uneaſy ſenſation as a flame applied to that part would occaſion; hence the title of *flammula*, or little flame, by which this genus of plants was formerly diſtinguiſhed.

MULTISILIQUÆ is likewiſe the name of a claſs in Ray and Boerhaave, conſiſting, as the foregoing term, of plants which have numerous capſules or ſeed-veſſels.

MUSCI, Moſſes. One of the ſeven families or claſſes into which all vegetables are divided by Linnæus in the Philoſophia Botanica. The characteriſtics of theſe plants, according to the Sexual Syſtem, are,

I. Anthers, without filaments.

II. The male flower, conſtituted by the preſence of the *anthers*, placed apart from the female, either on the ſame or diſtinct roots.

III. The female flowers deprived of the *piſtillum*.

IV. The ſeeds devoid of both lobes (cotyledones) and proper coverings; ſo that they exhibit the naked embryo.

This tribe of plants, as well as the muſhrooms, ferns, and ſea-weed, is ſtill imperfectly known. Dillenius, profeſſor of botany at Oxford, was the firſt who attempted an arrangement of them. In his Catalogus Plantarum circa Giſſam, publiſhed at Francfort, in 1719; and afterwards in his Hiſtoria Muſcorum, publiſhed at Oxford, in 1741, he divides the Moſſes into ſixteen genera. This arrangement, however, includes the lichens, ſome of the fuci, and other plants which belong to very different families. The work in queſtion is, notwithſtanding, valuable, in having introduced the knowledge of upwards of two hundred plants, which were unknown before Dillenius: it is, beſides, of all his works of this kind, the beſt executed, both for the deſcriptions and figures, and ſhould ſerve as a model to

ſuch

ſuch authors as intend to publiſh in detail the hiſtory of any particular family of plants.

Micheli, in a work entitled, Nova Plantarum Genera, publiſhed at Florence, in folio, in 1729, divides the moſſes into two ſections, from the figure and ſituation of their flowers. Theſe ſections comprehend together ſixteen genera, amongſt which are improperly arranged, like thoſe of Dillenius, ſeveral of the lichens and other ſea-weed.

The diſcovery of the ſeeds of the moſſes, though made by Dillenius in 1719, is arrogated by Linnæus to himſelf, who did not begin to write till 1735. *Vide* FRUCTUS.

In Ray's method the moſſes form the third claſs; in Tournefort's they conſtitute a ſingle genus, by the name of *muſcus*, in the firſt ſection of the ſeventeenth claſs, which comprehends the moſſes, muſhrooms, and ſome of the algæ or ſea-weed, and is diſtinguiſhed by the name of *aſpermæ*, or plants without ſeed; the ſeeds of the moſſes not having been detected by Tournefort.

In the Sexual Syſtem, theſe plants conſtitute the ſecond order of the claſs *cryptogamia*, which contains all the plants, in which the parts of the flower and fruit are wanting, or not conſpicuous. This order is ſubdivided into eleven genera, from the preſence or abſence of the calyx, which, in theſe plants, is a veil or cover like a Monk's cowl, that is placed over the male organs or tops of the ſtamina, and denominated *calyptra*; from the ſexes of the plants, which bear male and female flowers, ſometimes on the ſame, ſometimes on diſtinct roots; and from the manner of growth of the female flowers, which are ſometimes produced ſingly, ſometimes in bunches or cones. Theſe diſtinctions are moſtly borrowed from Dillenius, whoſe excellence in developing this part of the vegetable kingdom, Linnæus very readily acknowledges.

MUSCI, is likewiſe the name of the fifty-ſixth order in Linnæus's Fragments of a Natural Method, conſiſting of the following genera, which are exactly thoſe of the ſecond order in the claſs *cryptogamia*, and agree in the general characters juſt mentioned.

Bryum,

Linnæan Genera.			English Names.
Bryum,	—	—	Thread-mofs.
Buxbaumia.			
Fontinalis,	—	—	Water-mofs.
Hypnum,	—	—	Feather-mofs.
Lycopodium,	—	—	Club-mofs.
Mnium,	—	—	Marfh-mofs.
Phafcum,	—	—	Earth-mofs.
Polytrichum,	—	—	Golden maiden-hair.
Porella,	—	—	Hair-mofs.
Sphagnum,	—	—	Bog-mofs.
Splachnum,	—	—	Bottle-mofs.

Habit and Structure of the Plants of this Order.

Thefe plants refemble the pines, firs, and other evergreens of that clafs, in the form and difpofition of their leaves, and manner of growth of the female flowers, which are generally formed into a cone.

They frequently creep, and extend themfelves like a carpet, upon the ground, trees, and ftones, being generally collected into bunches or tufts. The fmalleft, as *buxbaumia,* are only four lines, or the third part of an inch, in height; and the largeft fpecies of *lycopodium,* do not exceed five or fix inches.

Few of the moffes are annual plants: fmall as they are, the greater number are perennial and evergreens. Their growth is remarkably flow, as may be judged by the time which the *anthers,* or male organs, take to ripen; this, reckoning from the firft appearance of the *anthers* to the difperfion of their powder or male duft for the purpofe of impregnation, is generally four or fix months.

Although preferved dry feveral years, thefe plants have the fingular property of refuming their original verdure upon being moiftened; perhaps, they likewife refume their vegetative faculty—a circumftance which future experiments muft determine.

Moffes delight in a cool moift fituation, and north expofure, where they are fcreened from the fun.

 The

The ROOTS are fibrous, flender, branched and fhort.

The STEMS and branches are cylindric, and weak; they creep upon the ground, and ftrike root on every fide.

The LEAVES are very fmall and undivided, and differ with refpect to fituation, being either alternate, oppofite, or placed by fours round the ftalk.

They have no foot-ftalk, nor middle rib that is perceptible, being feated immediately upon the ftem, half of which they embrace in golden maiden-hair; fo that they do not appear to be true leaves, any more than thofe of the palms and ferns.

Thefe plants, like the pines, are covered with no fort of down or pubefcence.

The FLOWERS are univerfally male and female; in lycopodium, fphagnum, phafcum, hypnum, and water-mofs, the male flowers are produced upon the fame plant with the female, and ftand above them; in golden maiden-hair, the flowers of different fexes are produced on diftinct plants; in *mnium* and *bryum* they are produced, fometimes on the fame, fometimes on diftinct plants.

The male flowers, which confift entirely of the *anthers*, and their covering, proceed either fingly or in clufters from the extremity of the branches, or angles of the leaves; and are feated immediately upon the branches, as in porella, and water-mofs; or fupported by a long foot-ftalk, as in bryum and golden maiden hair.

The female flowers, which generally refemble capfules or cones, are all placed immediately upon the ftem or branches without any foot-ftalk, and proceed fingly, either from the wings of the leaves or fummit of the branches. When produced upon the fame plant with the male, they are always placed under them.

The female cones of the moffes greatly refemble, as we have faid, thofe of the pines, and other evergreen trees of that clafs; the fcales which form them are true leaves, each containing, in its wing or angle, a fingle feed. When the feeds are ripe, the cones in queftion probably open, for their difperfion. When fhut, they refemble buds, and have

fometimes

ſometimes been ignorantly miſtaken for ſuch. The female flowers of the genus *porella* have not yet been diſcovered.

The FLOWER-CUP in this order, if it can be called ſuch, is that appearance reſembling a veil or monk's cowl, which, in the male flowers, covers, or is ſuſpended over, the tops of the ſtamina, like an extinguiſher, and is termed by Linnæus, *calyptra*. From the preſence or abſence of this cover, which falls before the opening of the *anthers*, are the genera of this tribe of plants chiefly diſtinguiſhed by Dillenius, and, after him, by Linnæus.

The PETALS in this order are univerſally wanting.

The male and female parts of generation in this numerous claſs of plants, have been deſcribed above. The flowers were, at the ſame time, ſaid to be male and female. In the genus *buxbaumia*, ſo named from Dr. Buxbaum, a German, who firſt diſcovered it in the neighbourhood of Aſtracan, repeated obſervations ſeem to eſtabliſh it beyond a doubt, that the flowers are hermaphrodite. After the fall of the outward covering or veil, formerly mentioned, the *anthers* are found to be covered with another hood, termed by Linnæus, *operculum*, within which, both Mr. Martyn and Dr. Linnæus diſcovered an *anthera* ſuſpended by its filament; and at the bottom of the capſule, formerly conſidered as the *anthera*, were found ſeveral ſeeds under the form of a yellow-green impalpable powder, more unctuous than that of the other moſſes.

This ſingularity obſerved in the genus *buxbaumia* might create a ſuſpicion that the other moſſes, which have their *anthers* covered, like it, with an *operculum*, have, likewiſe, their ſtamina or male organs contained within the ſame covers with the female; and that what have hitherto been judged ſeeds in the cones of the plants regarded as female, are, in fact, only buds or ſhoots which perform the office of ſeeds. But the knowledge we have acquired of the nature of the *anthers* of the other moſſes, and of the powder or duſt which they contain, is ſufficient demonſtration, that what has been termed the capſule in the genus *buxbaumia*, is really an *anthera*, which it every way reſembles externally, although

although fomewhat different in its internal ftructure; that it contains a powder of the fame nature with the male duft of other plants; and finally, that it is only a *ftamen*, or male flower; the female flower being moft probably to be found on another individual.

With refpect to the powder contained in the *anthers* of the moffes, Dillenius affures us, that he has frequently fown of it, with a view to afcertain its real nature, but could never difcover in it the fmalleft tendency to vegetate, like feed; on the contrary, the experiments of the fame ingenious naturalift, and of the learned Haller, fufficiently evince, that the powder of the female tops or cones of *mnium* being fown, forms productions in every thing fimilar to the parent plant.

Upon the whole, there is little doubt, that the cones and ftars obferved in the moffes, are female flowers; and that the capfules and fmall bodies endowed with a germinating faculty, which are found between the fcales of thefe cones, are true feeds, or at leaft, fhoots and fuckers which fupply their place.

The moffes in general are almoft taftelefs, have few juices, and being once dried, do not readily imbibe moifture from the air. Thofe which grow in water, being thrown into the fire, turn red, and are reduced to afhes without receiving or communicating any flame; on which account fome fuperftitious people, the Siberians in particular, place water-mofs in their chimnies, as a prefervative againft fire.

From the male flowers of fome of the moffes, particularly of *lycopodium*, is difperfed a prodigious quantity of yellow, fulphureous, and inflammable duft, which, according to Olearius, fparkles in the fire like falt-petre, and is known, like that of the pines, by the name of vegetable fulphur.

Moft of the moffes are purgative. The *felago* of Dillenius operates both by vomiting and purging, and is reckoned as violent and dangerous as hellebore. Golden maiden-hair is a powerful fudorific.

A fpecies of *lycopodium*, a native of India, and diftinguifhed

guiſhed in the Hortus Malabaricus by the name of tana-pouel, is ſaid to be a mighty incentive to venery, and to be frequently uſed by the Indians for that purpoſe.

A decoction of *lycopodium* is employed, with ſucceſs, by the country people in violent diarrhœas. The male duſt is recommended for nephritic pains, and ſuppreſſions of urine. The ſame powder in decoction is uſed externally for deſtroying lice.

With a large ſpecies of *ſphagnum*, the inhabitants of Siberia ſtuff cuſhions and beds.

All theſe plants are of wonderful efficacy in preſerving dry ſuch bodies as are ſuſceptible of moiſture; and in retaining, for a long time, the humidity of young plants, without expoſing them to putrefaction. For this reaſon, ſuch plants as are to be ſent to any conſiderable diſtance, are generally wrapped up in moſs.

MUSCOSÆ, the name of the twentieth claſs in Hermannus's Method; conſiſting of plants without flower-cup or petals. Theſe are the ferns, and moſſes juſt deſcribed: for as to the *calyptra* or hood which covers the male organs of the latter claſs of plants, and is now conſidered as the calyx, it had either not engaged the attention of botaniſts in the time of Herman, or, at leaſt, had been conſidered as a part unconnected with the flower. Some modern botaniſts even are ſtill of opinion that the moſſes want both flower-cup and petals.

MUTILUS *Flos*, a mutilated flower; a flower ſo called which is occaſionally deprived of either all its petals, or of the greater part.

Mutilation in flowers is oppoſed to luxuriance, and generally aſcribed to a defect of heat.

In cold climates, the following plants, which are natives, ſome of warm, ſome of temperate countries, are ſubject to loſe their petals, yet bear flowers and ſeeds.

Tuſſilago anandria.
Campanula perfoliata.
Campanula euphraſiæ foliis.
Rubeola patula.
Salvia quæ horminum ſylveſt. lavendulæ flore.

Lamium

Lamium foliis caulem ambiente minus.
Ruellia capsulis teretibus.
Convolvulus pes tigridis.
Lychnis apetala lapponica.
Silene portensis.
Cistus salicis folio.
Helianthemum flore maculoso.

M. Adanson affirms that the same thing happens at Paris to sea-milk-wort, water-purslane, and *ammannia.*

Some of the campanulas, particularly that with eye-bright leaves, either occasionally lose their petals altogether, or produce them so small as to be scarcely perceptible.

Flowers which always want the petals, and are not, like the mutilated flowers, only occasionally deprived of them, are distinguished by the name of apetalous. *Vide* APETALUS *Flos.*

N.

NECTARIUM, from nectar, the fabled drink of the gods; defined by Linnæus to be a part of the *corolla*, or appendage to the petals, appropriated for containing the honey, a species of vegetable salt under a fluid form, that oozes from the plant, and is the principal food of bees and other insects.

Notwithstanding this definition, which seems to consider the nectarium to be as necessary a part of the *corolla* as the petals, it is certain that all flowers are not provided with this appendage; neither indeed is it essential to fructification.

There is, besides, a manifest impropriety in terming the *nectarium* a part of the *corolla*. Linnæus might, with equal propriety, have termed it a part or appendage of the stamina, calyx, or pointal, as the appearance in question is confined to no particular part of the flower, but is as various in point of situation, as of form. The truth is, the term *nectarium* is exceedingly vague; and, if any determinate meaning can be affixed to it, is expressive of all the singularities which are observed in the different parts of flowers.

The

The tube or lower part of flowers with one petal, Linnæus confiders as a true *nectarium*, becaufe it is generally found to contain the fweet liquor formerly mentioned. This liquor Pontedera compares to that called amnios in pregnant animals, which enters the fertile or impregnated feeds: but that this is not at leaft its fole ufe, is evident from this circumftance, that the honey or liquor in queftion is to be found in flowers where there either are no feeds, or thofe which, from the want of male organs, cannot be impregnated. Thus the male flowers of nettle and willow; the female flowers of fea-fide laurel, and black bryony; the male and female flowers of *clutia*, *kiggelaria*, and butcher's broom, all abound with the honey or nectar alluded to.

Dr. Vaillant was of opinion that the *nectarium* was an effential part of the *corolla*; for which reafon he diftinguifhed the fingular appearances in fennel-flower and columbine, by the name of petals: the coloured leaves, which are now termed the petals, he denominates the flower-cup.

That the *nectarium*, however, is frequently diftinct from the petals, is evident, both from the well-known examples juft mentioned, as likewife from the flowers of monk's-hood, hellebore, *ifopyrum*, fennel-flower of Crete, barrenwort, grafs-of-Parnaffus, chocolate-nut, *cherleria*, and *fauvagefia*.

Thefe general obfervations being premifed, we proceed to take a nearer and more particular view of the principal diverfities, both in form and fituation, of this ftriking appendage to the flower.

I. In many flowers, the *nectarium* is fhaped like a fpur or horn; and that either in flowers of one petal, as valerian, water-milfoil, (*utricularia*) butter-wort, and calves-fnout; or in fuch as have more than one, as lark-fpur, violet, fumatory, balfam, and orchis.

II. In the following plants, the *nectarium* is properly a part of the *corolla*, as lying within the fubftance of the petals: ranunculus, lily, iris, crown-imperial, water-leaf, moufe-tail, ananas or pine-apple, dog's tooth violet, piperidge bufh, *vallifneria*, *hermannia*, *uvularia*, and *fwertia*.

III. The *nectarium* is frequently placed in a feries or row within

within the petals, though entirely unconnected with their ſubſtance. In this ſituation it often reſembles a cup, as in narciſſus. A *nectarium* of this kind is ſaid by Linnæus to crown the *corolla*. The following are examples: daffodil, ſea-daffodil, campion, viſcous campion, ſwallow-wort, *ſtapelia*, *cynanchum*, *nepenthes*, *cherleria*, balſam-tree, African ſpiræa, witch-hazel, *olax*, and paſſion-flower.

IV. In Indian creſs, buckler muſtard, (*Biſcutella*) Barbadoes cherry, and *monotropa*, the *nectarium* is ſituated upon, or makes part of the calyx.

V. The *nectarium* in baſtard flower-fence, is ſeated upon the *anthers* or tops of the ſtamina; whence the name *adenanthera*, or glandular anthera, which has been given to this genus of plants. In the following liſt it is placed upon the filaments: bean-caper, bay, fraxinella, marvel of Peru, bell-flower, lead-wort, *roëlla*, and *commelina*.

VI. In hyacinth, flowering ruſh, ſtock July-flower, and rocket, the *nectarium* is placed upon the ſeed-bud.

VII. In honey-flower, orpine, buck-wheat, *collinſonia*, *lathræa*, navel-wort, mercury, *clutia*, *kiggelaria*, ſea-ſide laurel, and African ſpiræa, it is attached to the common receptacle.

Laſtly, in ginger, nettle, dyer's weed, heart-ſeed, *coſtus*, turmeric, *grewia*, baſtard orpine, vanelloe, ſcrew-tree, and willow, the *nectarium* is of a very ſingular conſtruction, and cannot properly fall under any of the foregoing heads.

A more particular deſcription of the varieties which occur in this ſtriking part of the flower, would be unneceſſary in this place; as both its form and ſituation have been minutely attended to in our analyſis of the ſeveral natural orders or families of plants.

In diſcriminating the genera, the *nectarium* often furniſhes an eſſential character.

Plants which have the *nectarium* diſtinct from the petals, that is, not lodged within their ſubſtance, are affirmed by Linnæus to be generally poiſonous. The following are adduced as examples: monk's-hood, hellebore, columbine, fennel-flower, graſs-of-Parnaſſus, barren-wort, oleander, marvel

marvel of Peru, bean caper, fucculent fwallow-wort, frax-inella, and honey-flower.

The term *nectarium*, by which this part of the flower has been diftinguifhed, is the invention of Linnæus, who pretends even to have firft recognized the part in queftion. It is certain, however, that Tournefort, in 1694, obferved it in the paffion-flower, fwallow-wort, and fome other plants: and that Vaillant, in 1718, regarded it as a part depending upon the petals, which did not merit any particular appellation.

NOMINA, names.

The diftinguifhing of plants and collections of plants by particular names was a neceffary confequence of their methodical diftribution into claffes, genera, and fpecies.

The principles laid down on this fubject by Linnæus, who has new-modelled the names, as well as genera of former botanifts, fall properly to be confidered in this place. And, firft, of the

Names of Claffes and Orders.

I. The ancient botanifts diftinguifhed many of their claffes by primitive names; that is, names not expreffive of any particular character in the plants which compofe them. Hence the graffes of Tragus; the ferns, moffes, mufhrooms, and thiftles of Dodonæus; the palms and orchides of Lobelius; the lettuces, mallows, and cucumbers of Zaluzianfki; the night-fhades, poppies, and Bryonies of Cafpar Bauhin; the campanulas and borages of John Bauhin.

Mr. Adrien Royen is the firft, and perhaps the only one of the moderns, who has eftablifhed for a principle, that the name of every clafs ought to be derived from the name of fome well-known or remarkable genus in it.

Modern fyftematic writers, ftudious to abridge the fcience of botany, by fuppreffing all fuperfluous characters, and keeping the moft effential only in view, have eftablifhed, that the name of the clafs fhould not be fimple or primitive, but expreffive of a certain character or characters found in all the plants which compofe it. Hence the leguminous, fili-quofe,

quose, berry-bearing, umbelliferous, and lactescent plants of Morison; the cross-shaped, and butterfly shaped flowers of Tournefort; the rough-leaved plants, those which flower at the joints and form a head, of Ray; the *ensatæ*, *campanaceæ*, and other orders in Linnæus's Fragments of a Natural Method; and all the classes of the Sexual System.

The inconveniences arising from a strict compliance with this rule, are two: first, that it is difficult to find a name which shall be expressive of some circumstance that is common to all the genera of any particular class. Thus, many genera of the first class in the Sexual Method, *monandria*, might, with equal propriety, be referred to the second and third classes, *diandria* and *triandria*, the number of *stamina* being either one, two or three. In like manner, the class *icosandria* contains plants which have not the circumstance expressed in the title; the number of stamina being generally more, sometimes less than twenty: besides, the essential character of this class, which is the insertion of the stamina and petals into the inner part of the calyx, is not even alluded to in the title. In the same manner, the genus *cleome* does not possess the character expressed in the title *tetradynamia*, to which class it belongs. Examples of the like impropriety might be adduced from the classes *monœcia*, *diœcia*, and *polygamia* of the Sexual Method, and from the names of classes in other systems.

The other inconvenience just mentioned arises from employing names expressive of several characteristic marks; as these, in such cases, being too long and complex, assume a barbarous appearance, and become unintelligible. Wachendorffius's classes are particularly faulty in this respect. His *polliaplostemonopetalæ*, *eleutheromacrostemones*, and *distemonopleantheræ*, furnish striking examples.

II. The names of classes and orders should consist of a single word. All Linnæus's classical names are of this sort.

Cæsalpinus has employed definitions instead of names in his arrangement. Tournefort and Rivinus have frequently made unnecessary repetitions at the head of each class, occasioned

casioned generally from the circumstance of affixing part of the same name to two different classes. Thus the first class in Rivinus's Method consists of perfect, simple, *regular* flowers with one petal; the eleventh class of the same method is defined to consist of flowers with one petal that are perfect, simple, and *irregular*. In like manner, the definition of Tournefort's first class is expressive of the simplicity and *regularity* of the flowers contained in it, which consist of a single petal, that is bell-shaped; the fourth, of the simplicity and *irregularity* of the flowers contained in it, which consist of a single petal, that is lip-shaped.

III. Names of classes and orders, taken from the name of any plant or genus of plants, are only to be used, according to Linnæus, in natural methods. Of this kind are the palms, ferns, mosses, sea-weed, mushrooms, grasses, *orchideæ*, *corydales*, *cucurbitaceæ*, *calamariæ*, *rhœades*, *caryophyllæi*, and *piperitæ* of Linnæus's Fragments; the *palmæ*, *lilia*, *gramina*, of Royen's Natural Method. Such names are certainly convenient, as they serve to recall the idea of the general relations of each family or order; relations, which are, in a manner, collected in the plant from which the classical name is derived. The classic and generic name, however, is at no time to be precisely the same; as, besides the manifest impropriety of arranging a thing under itself, the greatest confusion would ensue from such arrangement. For this reason, Linnæus, when he uses classical names of this kind, generally changes the name of the genus which suggested the classical name in question. Thus in the natural order *palmæ*, no genus of that name is to be found. In like manner, the genus *filix*, one of the ferns, is changed for *pteris*, because he has distinguished that order of plants by the general or classical name of *filices*. It is upon the same principle that the ingenious Royen has substituted the Greek name *lirium*, instead of *lilium*, the more common name of that genus, because *lilia* is the name by which he has distinguished the class.

IV. Names of classes and orders are not to be derived from the habit, virtues, and sensible qualities of plants, nor

from

from the form, ſituation, and other circumſtances of the roots and leaves; as ſuch appellations are not in the ſpirit of ſyſtematic arrangement. To this cenſure is ſubjected the *cordiales*, *dorſiferæ*, and *ſucculentæ* of ſome botaniſts; the *capillares* of Moriſon and Ray; the *bulboſæ* of Cæſalpinus; the *aſperifoliæ* of Ray; the *verticillatæ* and *ſtellatæ* of the ſame author.

Names of the Genera.

I. A genus of plants being a collection of ſpecies which agree in the parts of fructification, it is evident that all the ſpecies of the ſame genus muſt be marked or diſtinguiſhed by the ſame generical name. Thus the orange, lemon, and citron, being conſidered by Linnæus as forming one genus, are diſtinguiſhed by the generical name *citrus*, in this manner, *citrus aurantium*, the orange, *citrus medica*, the citron-tree, *citrus medica* limon, the lemon; this laſt being eſteemed a variety of the citron, in like manner as the ſhaddock, termed *citrus aurantium* decumana, is of the orange. Theſe fruits were reckoned three diſtinct genera by Tournefort.

II. The generical name is not only to be the ſame, but ſingle in all the plants of the ſame genus. Hence there is an impropriety in diſtinguiſhing blue monk's-hood or aconite, as did Bauhin, by the additional name of *napellus*; and the wholeſome ſpecies of the ſame genus, by that of *anthora*.

III. The ſame generic name is not to be applied to two different genera. Hence the *aconitum* of Ray is changed for *helleborus*; the *caltha* of Tournefort into *calendula*; the *cameraria* of Dillenius into *montia*; the *ſherardia* of Vaillant into *verbena*: the names ſo changed having been uſed to denominate other genera, with which thoſe in queſtion have no connection.

IV. Whoever conſtitutes a new genus, ſays Linnæus, is bound likewiſe to give it a name.

V. The generic name of a plant is to be fixed, before any attention be given to its name as a ſpecies.

VI. Generic names conſiſting of two entire diſtinct words, Linnæus is of opinion ſhould be totally excluded. For this reaſon he has changed the *bella donna*, *centaurium majus*, *coronæ*

corona solis, dens leonis, and *vitis idæa* of Tournefort, for *atropa, centaurea, helianthus, leontodon*, and *vaccinium*; the *crista galli* of Dillenius, for *rhinanthus*.

VII. Generic names compounded of two entire Latin words joined together, are deemed rather inelegant, and may be properly enough changed for a Greek compound of the same kind. Thus the com*aurea* of former botanists, is changed by Linnæus for *chrysocoma*, the etymology of which is the same.—The names of the following genera, although of Latin composition, are retained by Linnæus; ros*marinus*, cornu*copiæ*, semper*vivum*, and sangui*sorba*.

VIII. Generic names compounded of two words of different languages, are highly improper. Of this kind are the tamar*indus* and cardam*indum* of Tournefort; the mor*inda*, chrysanthem*indum*, and sap*indus* of Vaillant.

IX. The termination *oides*, very common with former botanical writers, has been justly exploded by Linnæus as inelegant and superfluous. Thus the *agrimonoides* of Tournefort, is changed for *agrimonia*; *alyssoides* for *alyssum*; *asteroides* for *buphthalmum*; *cyperoides* for *carex*; *nymphoides* for *menyanthes*; *pentaphylloides* for *potentilla*; *rhamnoides* for *hippophäe*; *ricinoides* for *croton*; *telephioides* for *andrachne*; *tribuloides* for *trapa*; *chrysanthemoides* for *osteospermum*; *cuminoides* for *lagæcia*; *astragaloides* for *phaca*; the *capnoides* of Ray, for *fumaria*; the *valerianelloides* of Bauhin, for *valeriana*. The *alsinastroides* and *jonthlaspioides* of Kramer, furnish likewise striking examples of the impropriety in question.

X. Names of genera compounded of two generic words, one of which is entire, are not to be imitated. For this reason Linnæus has changed the *canna*corus of Tournefort, for *canna*; *lilio*narcissus for *scilla*; *lin*agrostis for *eriophorum*; *lauro*cerasus for *padus*; the *capn*orchis of Bauhin, for *fumaria*. Greek compounds of this kind may be safely admitted; *elæ*agnus, *quasi oleæ agnus castus*, and *cis*sampelos, *quasi hederæ vitis*, furnish examples.

XI. Diminutives from other genera, or generic names formed from others with the addition of one or two syllables at the end, are improper, as seeming to indicate a connection, which,

which, perhaps, does not exiſt. For this reaſon Linnæus has changed the

Old Genera.		*Linnæan Genera.*
Aceto*ſella* — —	of Ray, for	*Rumex.*
Nap*ellus* — —		*Aconitum.*
Myrt*illus* — —		*Vaccinium.*
Lapp*ula* — —		*Myoſotis.*
Fabba*ria* — —		*Sedum.*
Ro*ſea* — —		*Rhodiola.*
Alſin*anthemos* —		*Trientalis.*
Moro*carpus* —		*Blitum.*
Lupina*ſter* — —	of Bauhin, for	*Trifolium.*
Sal*iunca* — —		*Valeriana.*
Alſina*ſtrum* — —	of Tournefort, for	*Elatine.*
Rapi*ſtrum* — —		*Myagrum.*
Limon*ium* — —		*Statice.*
Lap*athum* — —		*Rumex.*
Eruca*go* — —		*Bunias.*
Corallo*dendron* —		*Erythrina.*
Fago*pyrum* — —		*Helxine.*
Adoni*a* — —	of Plumier, for	*Myoſurus.*
Sedi*formis* — —		*Stratiotes.*
Lino*phyllum* — —		*Theſium.*
Alſina*ſtriformis* —		*Montia.*
Fung*oidaſter* —	of Micheli, for	*Elvela.*
Lenticula*ria* — —		*Lemna.*
Balſami*ta* — —	of Vaillant, for	*Tanacetum.*

XII. Generic names of plants borrowed from the animal and mineral kingdoms, the heavenly bodies, and moral qualities, are condemned by Linnæus, as introducing confu-

 ſion

ſion and obſcurity into the nomenclature of the ſcience. On account of this impropriety, he has changed the

Old Genera.		*Linnæan Genera.*
Elephas	of Tournefort, for	Rhinanthus.
Onagra		Oenothera.
Bugloſſum		Anchuſa.
Ephemerum		Tradeſcantia.
Stœchas		Lavandula.
Scolopendrum		Aſplenium.
Sphondylium		Heracleum.

Erinaceus — — of Dillenius, for Hydnum.

Locuſta	of Ray, for	Valeriana.
Sol		Helianthus.
Staphylinus		Daucus.

Ampelis	of other Botaniſts, for	Vitis.
Lagopus		Trifolium.
Meleagris		Fritillaria.
Natrix		Ononis.
Hippogloſſum		Ruſcus.
Phalangium		Anthericum.
Granatum		Punica.
Molybdæna		Plumbago.
Balanus		Nepenthes.
Patientia		Rumex.
Concordia		Agrimonia.

XIII. For the ſame reaſon, the nomenclature of botany ſhould not be confounded with that of anatomy, pathology, the materia medica, and the arts. Hence Linnæus has changed the

Old Genera.		*Linnæan Genera.*
Ptarmica	of Tournefort, for	Achillea.
Cardiaca		Leonurus.
Veſicaria		Alyſſum.
Vulneraria		Anthyllis.

Old Genera.		*Linnæan Genera.*
Auricula		Primula.
Epiglottis		Aſtragalus.
Priapus		Nepenthes.
Umbilicus		Cotyledon.
Paralyſis		Primula.
Soda		Salſola.
Sphacelus		Salvia.
Verruca	of other Botaniſts, for	Lapſana.
Candela		Rhizophora.
Sagitta		Sagittaria.
Serra		Biſſerrula.
Clitoris		Clitoria.
Muſcipula		Silene.
Corona		Helianthus.
Burſa		Thlaſpi.
Solea equina		Hippocrepis.

XIV. Names pertaining to claſſes and natural orders, are by no means to be applied to any particular genus. Hence *Fungus*, *Alga*, *Muſcus*, *Filix*, *Palma*, are very improper generic names: as are *Planta*, *Arbor*, *Frutex*, *Suffrutex*, *Herba*, and ſuch like terms, from their very general nature and ſignification.

XV. Latin diminutives, and other names of like origin expreſſive of ſome property in the parts of the plants ſo characterized, furniſh proper, though not elegant, generic names. Of this kind are,

Potentilla, Lin. (*potentia*, power) from its powerful virtues.

Pulſatilla, Tourn. (*pulſare*, to beat often) from its flowers being toſſed and ſhaken by the wind.

Limoſella, Lin. (*limus*, ſlime) from its native ſoil.

Nigella, Tourn. (*niger*, black) from the blackneſs of its ſeeds.

Clypeola,

Clypeola, Lin. (*clypeus*, a ſhield) from its ſeed-veſſel reſembling a ſhield.

Mitreola, Lin. (*mitra*, a mitre) from its mitre-ſhaped fruit.

Gladiolus, Tourn. (*gladius*, a ſword) from its ſword-ſhaped leaves.

Samolus, Tourn. (Samos, an iſland) from its place of growth.

Calendula, Ruppius, (*calendæ*, the firſt of every month) from its flowering at all ſeaſons, and during every month in the year.

Campanula, Tourn. (*campana*, a bell) from its bell-ſhaped flower.

Craſſula, Dillen. (*craſſus*, thick) from the thickneſs of its leaves.

Primula, Lin. (*primus*, firſt) from its early flowering.

Pinguicula, Tourn. (*pinguis*, fat) from the fatneſs of its leaves.

Hirtella, Lin. (*hirtus*, hairy) from the hairineſs of its branches.

Crucianella, Lin. (*crux*, a croſs) from its leaves being placed croſs-wiſe.

Sanicula, Tourn. (*ſano*, to cure) from its vulnerary quality.

Serratula, Dillen. (*ſerra*, a ſaw) from its ſawed leaves.

Spergula, Dillen. (*ſpargo*, to ſcatter) from the diſperſing or ſcattering of its ſeeds.

Convolvulus, Tourn. (*convolvo*, to twiſt together) from the convolutions or twiſtings of its ſtalks.

Aſperugo, Tourn. } (*aſper*, rough) from the roughneſs of
Aſperula, Lin. } the plants which compoſe the genus.

Mollugo, Lin. (*mollis*, ſoft) from its ſoftneſs.

Plumbago, Tourn. (*plumbum*, lead) from its lead-colour.

Solidago, Vaill. (*ſolidus*, ſolid) from its conſolidating quality.

Urtica, Tourn. (*uro*, to burn) from its ſtinging or burning upon being touched.

Lactuca, Tourn. and Vaill. (*lac*, milk) from its leaves, ſtalks, and flowers abounding in a white milky juice.

Tuſſilago,

Tussilago, Tourn. and Vaill. (*tussis*, the cough) from its great efficacy in coughs and catarrhs.

Spinacia, Tourn. (*spina*, a thorn) from its prickly fruit.

Salsola, Plum. (*sal*, salt) from the brackish taste of the plant.

Sedum, Tourn. (*sedeo*, to sit) from its station on walls and rocks.

Cornus, Tourn. (*cornu*, a horn) from the shell of the fruit, which is as hard as a piece of horn.

Juglans, Lin. (*quasi* Jovis glans) from its being consecrated to Jupiter.

Ranunculus, Tourn. (*rana*, a frog) from its growing in moist places, which are frequented by frogs.

Lavandula, Tourn. (*lavo*, to wash) from its being used in baths and washes, on account of the fragrancy of its smell.

Juncus, Tourn. (*jungo*, to join) from the stalks being joined together, and wrought into baskets and other useful utensils, when dried.

Ledum, Rupp. (*lædo*, to hurt) from its offensive smell.

Salix, Tourn. (*salio*, to leap) from its quick growth.

Reseda, Tourn. (*resedare*, to appease) from its allaying pain.

Borago, Tourn. (*quasi cor ago*, to take heart) from its exhilarating quality.

Ferula, Tourn. (*ferio*, to strike) from rods being formerly made of its stalks, with which school-masters corrected their scholars.

Biserrula, Lin. (*bis*, twice, and *serra*, a saw) from its pods being sawed or indented on both edges.

Biscutella, Lin. (*bis*, twice, and *scutum*) from the fruit resembling a double buckler.

Tropæolum, Lin. (*tropæum*, a trophy) from its fancied resemblance to the insignia of a trophy.

Phaseolus, Tourn. (*phaselus*, an oblong swift ship) from the husk or covering of the seeds resembling the hulk of a galley.

Pyrola, Tourn. (*pyrus*, a pear) from its pear-shaped leaves.

Proſerpinaca, Lin. (*ſerpo*, to creep) from its ſtalks creeping on the ground.

Medicago, Tourn. (*Media*, the name of a country) from its having been brought into Greece, from Media, by Darius Hyſtaſpes, as Pliny relates.

Coronilla, Tourn, (*corona*, a crown) from its flowers being collected in bunches at the termination of the ſtalks.

Arenaria, Lin. (*arena*, ſand) from its native ſoil.

Convallaria, Lin. (*convallis*, a valley) from its common place of growth.

Clavaria, Vaill. (*clavus*, a club) from its habit and appearance.

Capraria, Lin. (*capra*, a ſhe-goat) from its being browzed on by goats.

Cochlearia, Tourn. (*cochleare*, a ſpoon) from its leaves being hollowed like a ſpoon.

Coriaria, Niſſol. (*corium*, leather) from its uſe in tanning.

Cymbaria, Ammannus, (*cymba*, a boat or ſkiff) from the figure of its fruit.

Dentaria, Tourn. (*dens*, a tooth) from its roots being compoſed of a great number of ſcales reſembling teeth.

Fragaria, Tourn. (*fragrans*, fragrant) from its fragrant aromatic ſmell.

Globularia, Tourn. (*globus*, a globe or ſphere) from the figure of the flower.

Herniaria, Tourn. (*hernia*, a rupture) from its efficacy in ruptures.

Lunaria, Tourn. (*luna*, the moon) from the figure of its fruit or ſeed-veſſels.

Matricaria, Tourn. and Vaillant, (*matrix*, the womb) from its efficacy in diſeaſes of the uterus.

Pulmonaria, Tourn. (*Pulmones*, the lungs) from its efficacy in diſorders of the breaſt and lungs.

Parietaria, Tourn. (*paries*, a wall) from its growing on old walls.

Mirabilis, Ray, (*Lat.* admirable) from the beautiful diverſity of colours in its flowers.

Sempervivum, Rupp. (*ſemper*, always, and *vivo*, to live) from its continual verdure.

Perſicaria,

Perſicaria, Tourn. (*perſica*, a peach-tree) from the reſemblance of its leaves to thoſe of the peach-tree.

Sagittaria, Lin. (*ſagitta*, an arrow) from its arrow-ſhaped leaves.

Sanguinaria, Dillenius, (*ſanguis*, blood) from its juice, which is of a yellow colour, inclining to red.

Saponaria, Lin. (*ſapo*, ſoap) from the deterſive quality of the leaves.

Scoparia, Lin. (*ſcopæ*, a beſom) from the uſe to which the plant is generally applied.

Momordica, Tourn. (*mordeo*, to bite) from the appearance of the ſeeds, which are flat and compreſſed, as if they had been grinded or chewed.

Scrophularia, Tourn. (*ſcrophula*, king's evil) from its ſuppoſed efficacy in ſcrophulous complaints.

Trifolium, Tourn. (*tres*, three; and *folium*, a leaf) from its bearing finger-ſhaped leaves, each leaf conſiſting of three ſmaller leaves furniſhed with ſhort partial foot-ſtalks.

Paſſiflora, Lin. (*patior*, to ſuffer, and *flos*, a flower) from the fancied reſemblance of the organs of generation to a hammer and nails, the inſtruments of ſuffering.

Stellaria, Lin. (*ſtella*, a ſtar) from the figure of its flower.

Subularia, Ray, (*ſubula*, an awl) from its awl-ſhaped leaves.

Utricularia, Lin. (*utriculus*, a little bladder) from the round two-horned veſſels diſtended with air, which it bears on its roots.

Glorioſa, Lin. (*gloria*, glory, excellence) from the beautiful and ſuperb appearance of its flowers.

Angelica, Lin. (*lat.* angelic) from the approved virtues of its root and ſeeds.

Fontinalis, Dillen. (*fons*, a fountain) from its place of growth.

Sanguiſorba, Ray, (*ſanguis*, blood, and *ſorbeo*, to drink up) from its great efficacy againſt ſpitting of blood.

Turritis, Tourn. (*turris*, a tower) from its height.

Impatiens, Ray (in, not, and *patior*, to ſuffer) from the elaſticity of its fruit, which may therefore be ſaid not to bear the touch.

Imperatoria,

Imperatoria, Tourn. (*imperator*, a commander) from the great efficacy of its root in medicine.

Hepatica, Rupp. and Dillen. (*hepar*, the liver) from the figure of its leaves.

Pedicularis, Tourn. (*pediculus*, a loufe) from its fuppofed efficacy in deftroying lice.

Saxifraga, Tourn. (*faxum*, a rock, and *frango*, to break) from its growing on the clefts of rocks.

Parnaffia, Tourn. (*Parnaffus*, a mountain in Phocis) from its place of growth.

Iberis, Rupp. and Dillen. from the kingdom of Iberia or Spain.

Smyrnium, Tourn. from the city of Smyrna.

Nepeta, Lin. from a town in Italy of that name.

Arabis, Lin. from the kingdom of Arabia.

Molucceila, Lin. from the Molucca iflands.

Arethufa, Gronovius, from the celebrated fountain of that name, near Syracufe in Sicily.

Punica, Tourn. (*Poeni*, the Carthaginians) from the city Carthage.

Thapfia, Tourn. from *Thapfus*, a town of *Africa propria*, near which Scipio and Juba were defeated by Cæfar.

Colchicum, Tourn. from Colchis, a country of antient Afia, to the Eaft of the Euxine Sea, celebrated for the expedition of Jafon and the Argonauts.

Patagonula, Lin. from Patagonia, a country in South America.

Carica, Lin. from Caria, a country in leffer Afia.

Ligufticum, Tourn. from Liguria, a province of Italy.

Marrubium, Tourn. from a town in Italy, now San Benedetto.

Toluifera, Lin. from its producing the fubftance known by the name of Balfam of Tolu.

Indigofera, Lin. from its producing the colour known by the name of Indigo.

Digitalis, Tourn. (*digitus*, a finger) from its flower, refembling the finger of a glove.

Scabiofa,

Scabiosa, Tourn. (*scabies*, scab, itch) from its efficacy in disorders of the skin.

Amthystea, Lin. from its flowers resembling an amethyst in colour.

Gratiola, Lin. (*gratia*, favour, efficacy) from its use in medicine.

Ziziphora, Lin. from the Indian name Zizi.

Jambolifera, Lin. from the Indian name Jambolo.

Uvaria, Lin. (*Uva*, a grape) from the figure of its fruit.

Uvularia, Lin. from the fancied resemblance of its fruit to the uvula of the throat.

Craniolaria, Lin. (*cranium*, the scull) from the nut which, in figure, resembles the scull of some wild beasts.

Piscidia, Lin. (*piscis*, a fish) from the rare quality possessed by its bark, of intoxicating fish. See *Papilionaceæ*.

XVI. Names borrowed from the fables of the poets, or intended to perpetuate the memory of some celebrated men, and particularly of the patrons of botanical knowledge, are admitted into the modern nomenclature, which, however, excludes the numerous list of generical names in commemoration of saints and illustrious men in other sciences.

The poetical names of genera are as follows; *Ambrosia*, *Nepenthes*, *Cornucopiæ*, *Crocus*, *Protea*, *Centaurea*, *Altæa*, *Chironia*, *Achillea*, *Narcissus*, *Hyacinthus*, *Amaryllis*, *Phyllis*, *Pæonia*, *Cerbera*, *Adonis*, *Circæa*, *Medeola*, *Andromeda*, *Daphne*, *Syringa*, *Canna*, *Myrsine*, *Mentha*, *Smilax*. A very slight acquaintance with the poets, particularly with Ovid's Metamorphoses, will render any comment upon these names altogether unnecessary.

The following genera are denominated from gods, kings, and patrons of the science.

Asclepias, Tourn. from Æsculapius, the god of physic.

Mercurialis, Tourn. from Mercury, the interpreter and messenger of the gods.

Hymenæa, Lin. from Hymen, the god of marriage.

Serapias, Lin. from Serapis, the idol worshipped by the Egyptians; or, perhaps, from Serapion, the celebrated Arabian physician.

Satyrium,

Satyrium, } Lin. } from the Satyrs, a fort of wood-land
Satureia, } Tour. } deities, fuppofed to prefide over the libidinous actions of men; the name is very properly applied to the firft genus, on account of its fuppofed aphrodifiac or ftimulating quality.

Ixora, Lin. the idol worfhipped by the natives of Malabar.

Tagetes, Tourn. and Vaill. from Tages, a grandfon of Jupiter, and inftructor of the ancient Tufcans in augury and the occult fciences.

Nymphæa, Tourn. from the nymphs in general, but particularly thofe who prefided over waters.

Naias, Lin. from the naiads, a clafs of nymphs who prefided over rivers and fountains.

Dryas, Lin. from the dryads, another clafs of nymphs, who prefided over woods and trees, particularly the oak, (δρυς, *quercus*).

Artemifia, Tourn. and Vaill. the celebrated wife of Maufolus, king of Caria.

Helenia, Lin. from Helen, the wife of Menelaus.

Atropa, Lin. from Atropos, one of the PARCÆ, or fatal fifters, to whom was committed the charge of cutting the thread of life.

Lyfimachia, Tourn. from Lyfimachus, a king of Sicily.

Philadelphus, Lin. from Ptolemy Philadelphus, a king of Egypt.

Teucrium, Tourn. from Teucer, founder of the kingdom afterwards called Troy.

Valeriana, Tourn. from the celebrated Valerian family at Rome.

Gentiana, Tourn. from Gentius, a king of Illyria.

Pharnaceum, Lin. from Pharnaces, a king of Pontus.

Telephium, Tourn. from Telephus, a king of Myfia.

Borbonia, Lin. from the celebrated houfe or family of Bourbon.

Eugenia, Michel. from the illuftrious Prince Eugene of Savoy.

Piercea, Miller, from his grace Hugh Percy, firft duke of Northumberland.

Petrea, Houfton, from Lord Petre.

Cliffortia,

Cliffortia, Lin. from George Clifford, J. U. D. of Amsterdam, a great improver and patron of botany.

Stewartia, Lin. from the late excellent naturalist, and most munificent patron of learning, John Stuart, first earl of Bute.

Bosea, Lin. from a senator of Leipsick of that name.

Nicotiana, Tourn. from James Nicot, a Frenchman, who first imported the seeds of tobacco (the genus in question) into France.

XVII. Generic names in honour of celebrated botanists form a very considerable part of the modern nomenclature. The following list is entirely of this kind.

Theophrasta, Lin. from Theophrastus, the father of botany.

Crateva, Lin. from Cratevas, an ancient botanist, mentioned by Pliny in his Natural History.

Hippocratea, Lin. and Jacquin, from Hippocrates, the father of physic.

Musa, Plumier, from Antonius Musa, physician to Augustus Cæsar, and supposed to be commemorated by Virgil under the name of *Japis*, in the 12th book of the Æneid.

Dioscorea, Plumier, from Dioscorides, the celebrated Greek botanist.

Plinia, Plumier, from Pliny the elder, the celebrated naturalist.

Brunfelsia, Plumier, from Tho. Brunfels, Brunfelsius, a German divine, physician and botanist, who flourished in the sixteenth century.

Ruellia, Plumier, from Johannes Ruellius, a French-man, likewise of the 16th century, author of a Commentary on Dioscorides, and of a work in three books, on the Nature and History of Plants.

Crescentia, Lin. from Petrus de Crescentia, a senator of Bologna, who lived in the 15th century, and is author of a book entitled *Opus Ruralium Commodorum*.

Dorstenia, Plum. and Houst. from Theodoric Dorsten, a German botanist, author of a book entitled *Botanicon*, published at Francfort in 1540.

Gesneria, Plum. from the celebrated Conrad Gesner, author of several botanical works.

Fuchsia, Plumier, from Leonard Fuchs, a German of the 16th century, author of a History of Plants.

Matthiola, Plum. from P. A. Matthiolus, an Italian botanist, whose principal work is an excellent edition of Dioscorides, with ample illustrations.

Lonicera, Ray, from Adam Lonicer of Francfort, author of a History of Plants published in 1551.

Turnera, Plum. from Dr. William Turner, of Morpeth, author of an English Herbal, printed at London, in 1551.

Tragia, Plum. from Hieronymus Bock, commonly called Tragus, a physician and divine of Deux Ponts, author of a History of Plants first published at Strasburgh in 1539.

Dodonæa, Lin. from Dodoens, or Dodonæus, a German, author of a botanical work, published at Antwerp, in 1552.

Bellonia, Plumier, from Peter Belon, a French-man of the 16th century, author of a Voyage to the Levant, and of a Treatise on Cone-bearing trees.

Guilandina, Lin. from Melchior Guilandin, or Wieland, a Prussian, author of a treatise on the *Synonyma* of plants, and of a Dissertation on the plant from which the ancients made paper, first published in 1572.

Cordia, Plum. from Valerius Cordus, a German, author of a History of Plants.

Monarda, Lin. from Nicolas Monardes, a Spanish physician, and author of a History of such of the West India plants as are used in medicine, as likewise of a Treatise on Roses and Citrons, Oranges, &c.

Lobelia, Plumier, from M. de L'Obel, author of a History of Plants, in 1576.

Penæa, Plum. from Peter Pena of Narbonne, contemporary with L'Obel and L'Ecluse, in conjunction with the former of whom he published *Nova Stirpium Adversaria*, at Antwerp in 1576.

Clusia,

Clusia, Plumier, from L'Eclufe, a Frenchman, author of a Hiftory of Rare and Exotic Plants.

Clutia, Boerhaave, from Augerius Cloot, an ingenious botanift of the 17th century, who, to enrich the botanical garden at Montpelier with the plants of Africa, then little known, attempted a fcientific excurfion through the Barbary States, but was unfortunately ftripped both of his new acquifitions and of his liberty.

Rauwolffia, Plumier, from Leonard Rauwolf, a German, author of an Itinerary, or Travels to the Holy Land, and other parts of the Eaft, for the promotion of natural knowledge.

Cæfalpinia, Plum. from Cæfalpinus, an Italian, father of fyftematic botany.

Duranta, Plum. from Caftor Durante, an Italian, author of a Herbal in the fixteenth century.

Cameraria, Plum. from Joachim Camerarius, junior, a German phyfician and botanift, author of *Hortus Medicus et Philofophicus*, and fome other works.

Dalechampia, Plum. from Dalechamp, a phyfician of Lyons, in the fixteenth century, author of a General Hiftory of Plants.

Tabernæmontana, Plum. from one Theodore, a German, generally known by the name of Tabernæmontanus, from the village where he was born.—He lived in the fixteenth century, and publifhed a Hiftory of Plants, in folio, at Francfort.

Thalia, Plumier, from Johannes Thalius, a German botanift, author of a Flora, entitled *Sylva Hercynia*.

Alpinia, Plum. from Profper Alpinus, an Italian, author of feveral botanical works, particularly a Defcription of the Plants of Egypt.

Columnier, Plum. from Fabius Colonna, a noble Italian, who publifhed fome curious works in botany.

Bauhinia, Plumier, from the two illuftrious brothers, Cafpar or Gafpard, and John Bauhin, natives of Switzerland, and authors of fome well-known botanical works.

Gerardia, Plum. from John Gerard, an Englifh apothecary, of Nantwich, in Chefhire, who lived in the fixteenth

teenth century, and publiſhed the Herbal, or General Hiſtory of Plants, which is well known.

Robinia, Lin. from Robin, a Frenchman, who firſt introduced the plant (Falſe Acacia) into France from Canada.

Renealmia, Plum. from Paul Reneaume, a Frenchman, author of a Specimen of a Hiſtory of Plants.

Swertia, Lin. from Emmanuel Sweert, a Dutchman, who lived in the beginning of the ſeventeenth century, and publiſhed a botanical work, entitled *Florilegium*.

Beſleria, Plum. from Baſilius Beſler, a German apothecary, author of two large botanical works.

Marcgravia, } Plum. { from two ingenious botaniſts, Marc-
Piſonia, } { grave and Piſon, the firſt a German, the other a Dutchman, authors of a Natural Hiſtory of Braſil.

Hernandia, Plum. from Francis Hernandez, a Spaniſh botaniſt, of the ſeventeenth century, author of a Natural Hiſtory of Mexico.

Broſſæa, Plumier, from Guy de la Broſſe, a Frenchman, author of a book on the nature of plants.

Parkinſonia, Plum. from Mr. John Parkinſon, author of a Hiſtory of Plants, under the title of *Paradiſus Terreſtris*, and of a Treatiſe entitled *Theatrum Botanicum*.

Ambroſinia, Baſſius, from Bartholomew Ambroſini, an Italian botaniſt of the 17th century, author of a Hiſtory of Capſicums.

Cornutia, Plum. from Cornutus, a Frenchman, author of a treatiſe, entitled *Enchiridion Botanicum Pariſienſe*, and of a Hiſtory of Canada plants.

Paullinia, Lin. from Pauli, a Daniſh botaniſt, author of two treatiſes, entitled *Quadripartitum Botanicum*, and *Viridaria varia*.

Stapelia, Lin. from Stapel, a Dutchman, author of ſome botanical works, particularly a Deſcription of Theophraſtus's plants.

Lœſelia, Lin. from Lœſel, a Pruſſian, author of a Flora, or Enumeration of the Plants that are natives of Pruſſia.

Zanonia, Lin. from Zanoni, an Italian, author of a Treatiſe on the Alpine Plants.

Moriſona, Plum. from Dr. Robert Moriſon, author of an Univerſal Hiſtory of Plants, and ſeveral other curious botanical works.

Bontia, Plum. from Bontius, an ingenious Dutch botaniſt, author of a Natural Hiſtory of the Eaſt Indies.

Aldrovanda, Monti, from the celebrated Italian naturaliſt Ulyſſes Aldrovandus.

Bocconia, Plum. from Paul Boccone, a native of Sicily, author of a Treatiſe on the rare and curious Plants of that iſland, and of ſome other botanical works.

Muntingia, Plum. from Abraham Munting, a Dutch naturaliſt of the 17th century, author of ſome ingenious botanical works, particularly *Phytographia curioſa*, *Alcedarium*, and *de Britannica Herba.*

Tillandſia, Lin. from Tillands, a Swediſh botaniſt, author of a Catalogue or Enumeration of the Plants that are Natives of Abo.

Breynia, Plum. from John Breyn, or Breynius, a native of Poland, author of a Diſſertation on Ginſeng.

Petiveria, Plum. from Mr. James Petiver, an apothecary of London, author of a Britiſh Herbal, and many other curious botanical works.

Dodartia, Tourn. from M. Dodart, a Frenchman, author of Memoirs towards a Hiſtory of Plants. His plates, forty-five in number, are reckoned excellent.

Commelina, Plum. from John Commelyn, a Dutchman, who, beſides the ſhare which he took in the publication of that ſplendid work, the *Hortus Malabaricus*, is likewiſe author of *Heſperides Belgiæ*, and *Hortus Amſtelodamenſis.*

Rheedea, Plum. from Henricus van Rheede van Drakenſtein, a Dutchman, governor of Malabar, who publiſhed, at his ſole expence, in 1676, the celebrated *Hortus Malabaricus*, in 12 vols. folio.

Mentzelia, Plum. from Chriſtian Mentzel, or Mentzelius, a Pruſſian, author of an Index of rare and curious Plants.

Sibbaldia, Lin. from Robert Sibbald, a Scotchman, who lived in the 17th century, and publiſhed a Natural Hiſtory of Scotland under the title of *Scotia illuſtrata*.

Triumfetta, Plum. from John Baptiſt Triumfetti, an Italian, author of a Treatiſe on Vegetation, and other botanical works.

Magnolia, Plum. from Peter Magnol, profeſſor of botany at Montpelier.

Rajania, Plum. from Mr. John Ray, the father of Engliſh botany.

Hermannia, Tourn. from Dr. Paul Herman, a Saxon, profeſſor of botany at Leyden, and author of an ingenious method, with ſeveral other curious works.

Knautia, Lin. from Chriſtian Knaut, a Saxon, author of a Botanical Method.

Rivina, Plum. from Rivinus, a Saxon, profeſſor of botany at Leipſic, and author of an Eaſy Method of claſſing Plants.

Marchantia, March. from M. Marchant, a Frenchman, author of ſome ingenious papers in the Memoirs of the Academy of Sciences.

Plukenetia, Plum. from Mr. Plukenet, an ingenious Engliſh botaniſt, in whoſe works are deſcriptions of eight thouſand ſeven hundred plants, with two thouſand ſeven hundred figures.

Plumeria, Tourn. from Father Plumier, an ingenious Frenchman, noted for his diſcoveries of American plants.

Tournefortia, Plum. from M. Pitton de Tournefort, the illuſtrious French botaniſt.

Volkameria, Lin. from George Volkamer, a German, author of the *Flora Norimbergenſis*.

Camellia, Lin. from George Camellus, a Jeſuit, author of ſome ingenious papers in the Engliſh Philoſophical Tranſactions, and of a treatiſe *de fabâ Ignatii ſive vomicâ*.

Rudbeckia, Lin. from M. Rudbeck, a Swede, author of a botanical work, entitled, *Campus Elyſius*.

Rumpfia, Lin. from Rumphius, a Dutchman, author of the Herbarium Amboinicum.

Scheuchzeria,

Scheuchzeria, Lin. from J. James Scheuzer, or Scheuchzer, a Swiſs, profeſſor of botany, author of an Arrangement of the Graſſes; a Journey over the Alps; and a Treatiſe entitled *Phyſica ſacra*.

Sloanea, Plumier, from Sir Hans Sloane, the celebrated Engliſh phyſician and naturaliſt.

Boerhaavia, Vaill. from the very eminent Dr. Boerhaave, profeſſor of phyſic and botany at Leyden.

Zanichellia, Lin. from Zanichelli, an Italian, author of a Hiſtory of Plants.

Heucheria, Lin. from Heucher, a German, author of an Index or Catalogue of the Plants in the Botanical Garden at Wittemberg, and of a Treatiſe *de Vegetabil. magicis*.

Niſſolia, Jacquin. from Niſſole, an ingenious Pariſian, author of ſeveral papers in the Memoirs of the Academy of Sciences.

Reaumuria, Haſſelquiſt, from M. de Reaumur, an ingenious French academician and naturaliſt.

Kæmpferia, Lin. from Dr. Kæmpfer, a German, author of the Hiſtory of Japan; the curious Diſſertations on Tea, and *Morus Papyrifera*; and the ingenious collection known by the name of *Amœnitates Exoticæ*.

Juſſiæa, Lin. from Meſſrs. Antony and Bernard Juſſieu, two ingenious French botaniſts, authors of ſeveral excellent papers in the Memoirs of the Academy of Sciences at Paris.

Barleria, Plum. from Jacob Barrelier, a Frenchman, author of a Hiſtory of the Plants of France, Spain, and Italy.

Feuillea, Lin. from Feuillé, a Frenchman, author of a Hiſtory of the Plants of Chili and Peru.

Marſilea, Lin. from Marſili, an ingenious Italian, author of a Diſſertation on the Generation of Muſhrooms.

Garidella, Tourn. from Garidel, a Frenchman, author of the Hiſtory of the plants of Provence.

Iſnarda, Lin. from Danti d'Iſnard, a Frenchman, author of ſome botanical papers in the Memoirs of the French Academy of Sciences.

Valantia, Tourn. from M. Vaillant, an ingenious French-

man,

man, author of a Treatiſe on the Structure of Flowers, and of ſeveral curious botanical papers in the Memoirs of the French Academy.

Ruppia, Lin. from Ruppius, a German, author of the *Flora Jenenſis*, and of an Improvement of Rivinus's Method.

Pontederia, Lin. from Pontedera, an Italian, author of ſome botanical diſſertations, and of a method which combines thoſe of Tournefort and Rivinus.

Montia, Micheli, from Monti, an Italian, author of a work entitled *Prodromus Stirpium agri Bononienſis*.

Dillenia, Lin. from Dillenius, a German botaniſt, noted for his Obſervations on the Moſſes, Muſhrooms, and Sea-weed: he is likewiſe author of the *Flora Giſſenſis*, and *Hortus Elthamenſis*.

Frankenia, Lin. from John Frank, a phyſician of Ulm, and author of a Treatiſe on Male-Balſam-Apple, and Water-germander.

Buxbaumia, Lin. from Dr. Buxbaum, a German, author of an Enumeration or Catalogue of the Plants around Hal, in Saxony, and of five centuries of eaſtern plants.

Heiſteria, Jacquin. from Heiſter, a German, author of a Treatiſe on the Utility of the Leaves, and of a Syſtem which ſeems to have been ſuggeſted by that of Ray.

Tillæa, Micheli, from Tilli, an Italian, author of a Catalogue of the Plants in the Gardens of Piſa.

Martynia, Houſton, from Mr. John Martyn, profeſſor of botany at Cambridge, author of a Commentary on Virgil's Bucolics and Georgics, and of ſeveral other botanical tracts.

Hamellia, Jacquin, from M. Duhamel de Monceau, an ingenious Frenchman, author of la Phyſique des Arbres, Traité des Arbres Fruitiers, and ſome other valuable works in botany, gardening and huſbandry.

Krameria, Loefling, from Kramer, a German, author of a work entitled *Tentamen Botanicum*.

Michelia, Lin. from Micheli, an Italian, noted for his Obſervations on Muſhrooms and Sea-weed; he is likewiſe author

author of a Catalogue of the Plants cultivated in the Botanical Garden at Florence.

Catesbæa, Lin. from Mr. Catesby, who discovered it, author of a Natural History of Carolina.

Milleria, Houston, from Mr. Philip Miller, author of the Gardener's Dictionary and Calendar.

Burmannia, Lin. from Dr. John Burman, professor of botany at Amsterdam, and author of several botanical works, particularly a Description of two hundred Plants from the Cape of Good Hope.

Houstonia, Lin. from the ingenious Dr. William Houston, who discovered several curious plants in the West-India islands.

Linnæa, Gronovius, from the celebrated naturalist, Sir Charles Linné, late professor of botany at Upsal in Sweden.

Waltheria, Lin. from Augustus Frederic Walther, a German, professor of botany at Leipsic, and author of a Catalogue entitled *Hortus Waltheri*.

Ludwigia, Lin. from Dr. Christopher Ludwig, professor of botany at Leipsic, and author of some very ingenious works, particularly Botanical Institutions, in which is proposed a method that combines together the very different methods of Linnæus and Rivinus.

Weinmannia, Lin. from Weinman, a German, author of a large botanical work, in ten volumes, folio, with plates beautifully coloured.

Sigesbeckia, Lin. from Dr. Sigesbeck, of Petersburgh, author of the *Flora Petropolitana*, and of two ingenious methods for arranging plants.

Ammannia, Houston, from John Amman, a Russian, author of a work entitled *Stirpes rariores Rutenicæ*.

Royena, Lin. from M. Adrien Royen, professor of botany at Leyden, author of the *Flora Leidensis*, in which he has suggested the idea of a natural method.

Seguieria, Loefling, from M. Seguier, a Frenchman, author of the *Bibliotheca Botanica*, and *Plantæ Veronenses*.

Halleria, Lin. from the very learned Dr. Albert Haller, professor

professor of botany at Gottingen, and author of a Natural Method.

Sauvagesia, Lin. from M. Sauvages, an ingenious Frenchman, author of a Method founded upon the Leaves.

Guettarda, Lin. from M. Guettard, a Frenchman, author of ingenious Observations on Plants.

Gmelina, Lin. from John Gmelin, a German, author of the *Flora Sibirica*, and of a Voyage to Siberia.

Wachendorfia, Lin. from Wachendorf, professor of botany at Utrecht, and author of a Natural Method of arranging Plants.

Ehretia, Brown, from Ehret, a German, who, in 1748, published at London, in folio, a work entitled *Plantæ rariores*, with twenty-six excellent figures illuminated.

Gleditsia, Lin. from Gleditsch, a German, professor of botany at Berlin, and author of an Arrangement of the Mushrooms, and of a History of the Academy of Sciences at Berlin.

Trewia, Lin. from Trew, a German, professor of botany at Nuremberg, author of a work entitled *Plantæ selectæ, decuriæ quatuor*, with forty-three excellent figures illuminated.

Hillia, Jacquin and Lin. from Sir John Hill, author of the Vegetable System, and of several other well-known botanical works.

Allionia, Loefling, from Allioni, an Italian, author of a History of the Rare Plants of Piedmont, and of a Methodical Synopsis of the Plants in the Garden at Turin.

Brownæa, Jacq. from Mr. Brown, author of the Civil and Natural History of Jamaica.

Adansonia, Lin. from M. Adanson, a Frenchman, author of a Voyage to Senegal; a work entitled Familles des Plantes; several papers in the Memoirs of the French Academy; and a Treatise upon the Baobab of Prosper Alpinus, which plant it is that Linnæus has distinguished by the name of *Adansonia*, in honour of this gentleman.

Halesia, Lin. and Ellis, from the reverend and celebrated Dr.

Dr. Stephen Hales, author of Vegetable Statics, justly stiled the Modern Theophrastus.

Queria, Loefling, from M. Quer, professor of botany at Madrid, and author of a Spanish Flora.

Minuartia, Loefling, from M. Minuart, professor of botany at Cadiz.

Gouania, Jacquin, from M. Gouan, a Frenchman, author of the *Hortus Regius Monspeliensis*.

Jacquinia, from M. Jacquin, a German, author of a Catalogue of American Plants, published at Vienna in 1762. This gentleman undertook his botanical expedition to the West Indies, by the desire, and at the expence of the emperor. He was afterwards, as I am informed, professor of botany at Augsburg.

Maranta, Plum. from Bartholomew Maranta, an ancient obscure botanist.

Kalmia, Lin. from Dr. Peter Kalm, professor of botany at Abo in Finland, and author of Travels in North America.

Solandra, Lin. from the late Dr. Solander of the British Musæum, long a pupil of Linnæus at Upsal.

Ellisia, Lin. from the ingenious John Ellis, Esq. F. R. S. author of a Natural History of Corallines.

Kuhnia, Lin. from Dr. Kuhn of North America, a pupil of Linnæus.

Gardenia, Ellis, from Dr. Garden of South Carolina, an industrious botanist.

Justicia, Houston, from the late James Justice, Esq. principal clerk of session at Edinburgh, a curious florist, and author of some valuable tracts in gardening.

Collinsonia, Lin. from Mr. Peter Collinson, F. R. S. a lover and patron of the sciences, of the last century, who introduced this plant from America into the English gardens.

Bufonia, Sauvage, from the ingenious M. de Buffon, a Frenchman, author of the celebrated Natural History.

Coldenia, Lin. from Dr. Colden of North America.

Brunia,

Brunia, Lin. from M. le Brun, author of the Travels into Mufcovy, Perfia, and part of the Eaft Indies.

Haffelquiftia, Lin. from Dr. Frederic Haffelquift, an ingenious naturalift, and pupil of Linnæus, who travelled into Egypt, Arabia, and the Holy Land, in queft of natural curiofities. His papers were revifed and publifhed by Linnæus, after his death, under the title of Haffelquift's Travels.

Loeflingia, Lin. from P. Loefling, a Swede, an ingenious pupil of Dr. Linnæus.

Grewia, Lin. from the celebrated Dr. Nehemiah Grew, author of the Anatomy of Plants.

Malpighia, Plumier, from Signior Malpighi, an ingenious Italian, of the 17th century, who communicated his difcoveries on the internal ftructure of plants to the Royal Society at London, at the fame time with Dr. Grew.

Morina, Tourn. from Dr. Morin of Paris.

Monnieria, Loefling, from M. le Monnier, profeffor of botany at Paris.

Laugeria, Jacq. from M. Laugier, profeffor of botany at Vienna.

Sibthorpia, Lin. from Dr. Sibthorp, the late profeffor of botany at Oxford.

Byttneria, Loefling, from M. Buttner, a Pruffian botanift.

Schwenckia, David Van Royen, from M. Schwenke, author of a Catalogue of the Officinal Plants cultivated in the Phyfical Garden at the Hague, 8vo. 1752.

Gronovia, Houfton, from M. Gronovius, a celebrated Dutch botanift, editor of the *Flora Virginica*.

Varronia, Brown, from Varro, the Roman, who lived about the time of Auguftus Cæfar, and wrote fome tracts on hufbandry.

Galenia, Lin. from the celebrated Galen.

Mefua, Lin. from Mefue, an Arabian botanift, who lived in the end of the eighth century.

Avicennia, Jacq. from Avicenna, an Arabian phyfician and botanift of the eleventh century.

Averrhoa,

Averrhoa, Lin. from Averrhoes, a native of Corduba, in Spain, who lived in the eleventh century.

Sarracenia, Tourn. from Sarrazin, an ingenious Frenchman, who introduced feveral Canadian plants into the European Gardens.

Ferraria, Burmannus, from Ferrarius, an Italian botanift of the 17th century, author of a Treatife on the Culture of Flowers, publifhed at Rome in 1740, with feventy-five excellent copper-plates.

Cherleria, Haller, from Cherlerus, a botanift of the fixteenth century, cotemporary with John Bauhin.

Geoffræa, Jacq. from M. Geoffroy, an ingenious naturalift of the laft century, author of feveral excellent works, particularly a large Treatife on the Materia Medica.

Moehringia, Lin. from Moehring, an ingenious botanift of the laft century, author of a Catalogue of the numerous plants cultivated in his own garden.

Browallia, Lin. from M. Browal, an ingenious botanift of the laft century, author of a Defence of the Sexual Syftem, in anfwer to Sigefbeck, who had attacked it with great fpirit.

Hebenftretia, Lin. from M. Hebenftreit, a German, profeffor of botany at Leipfic, and author of a work entitled *Definitiones Plantarum*, publifhed at Leipfic in 1731.

Artedia, Lin. from Peter Artedi, a learned Swedifh naturalift, who was unfortunately drowned, at the age of thirty, in 1735. His pofthumous works were publifhed by Linnæus in 1738.

Celfia, Lin. from Olaus Celfius, an ingenious botanift of the laft century, author of a book explaining the botany of the fcriptures.

Hottonia, Boerhaave, from P. Hotton, author of a Hiftory of Botany.

Sherardia, Dillen. from Dr. William Sherard, a very eminent botanift of the feventeenth century, author of an Introduction to Botany, under the title of *Schola Botanices*. His *Hortus ficcus*, or dried collection of plants, is faid to have

have conſiſted of twelve thouſand ſpecies; that of Sloane contains only eight thouſand.

Spigelia, Lin. from Adrian Spigelius, an Italian botaniſt, who lived in the beginning of the ſeventeenth century.

Jungermannia, Micheli, from Jungermannus, a botaniſt of the ſeventeenth century.

Garcinia, Lin. from M. Garcin, author of a Hiſtory of Indian plants.

Cortuſa, Boerhaave, from Cortuſus, a botaniſt of the ſixteenth century.

Cupania, Plum. from Cupanus, a botaniſt, who lived in the end of the ſeventeenth century.

Barreria, Lin. from M. Barrere, an ingenious botaniſt of the laſt century.

Stellera, Gmelin, from Steller, a botaniſt of the laſt century, who diſcovered it.

Lechea, Kalm. from M. Lech, an ingenious botaniſt of the laſt century.

Bobartia, Lin. from Dr. Bobart, of Oxford, who completed Moriſon's Univerſal Hiſtory of Plants.

Bromelia, Plum. from Bromel, a French botaniſt of the ſeventeenth century.

Fagonia, Tourn. from Dr. Fagon, ſuperintendant of the king's gardens at Paris.

Randia, Houſton, from Mr. Iſaac Rand, an ingenious Engliſh botaniſt.

Suriana, Plumier, from Joſeph Surian of Marſeilles, an eminent naturaliſt.

Tradeſcantia, Ruppius, from Mr. John Tradeſcant, an eminent Engliſh floriſt and antiquary.

Ximenia, Plumier, from Franciſcus Ximenes, a Spaniſh botaniſt of the 17th century, author of a Hiſtory of Mexican Trees and Plants.

Claytonia, Lin. from Dr. Clayton of Virginia, who diſcovered it.

Diervilla, Tourn. from M. Dierville, a French ſurgeon, who

who introduced it into the European gardens, from Nova Scotia, where he discovered it.

Bartramia, Lin. from Mr. John Bartram of Philadelphia, who discovered it.

Bannisteria, Houston, from Mr. Bannister, an ingenious botanist, who travelled into Virginia in search of plants.

Gundelia, Tourn. from Dr. Gundelscheimer, who accompanied Tournefort in his travels to the East.

Knoxia, Lin. from Mr. Knox, author of a History of the Island of Ceylon.

Lippia, Houston, from Dr. Augustus Lippi, who travelled into Egypt and Abyssinia, in search of natural curiosities.

Mitchella, Lin. from Mr. Mitchel, who travelled into Virginia in quest of plants.

Oldenlandia, Plumier, from Henry Bernard Oldenland, a German botanist, who travelled into Africa in quest of plants.

Buddleia, Houston, from Mr. Buddle, an ingenious English botanist.

Tozzia, Micheli, from the Abbé Tozzi, a learned Italian.

Blasia, Micheli, from M. Blasi, an Italian monk, addicted to the study of botany.

Riccia, Micheli, from Signior Ricci, an Italian knight.

Moræa, Miller, from Robert More, Esq. of Shrewsbury, an ingenious botanist.

Blæria, Lin. from Dr. Patrick Blair, author of a book entitled Botanical Essays, and of several other curious tracts in botany and gardening.

Hopea, Garden, from the ingenious and accurate Dr. John Hope, late professor of botany at Edinburgh.

Hudsonia, Lin. from Mr. Hudson, author of the *Flora Anglica*.

XVIII. Generic names, of Greek origin, expressive of the essential character, habit, place of growth, and virtues, or sensible qualities of any plant, are, in Linnæus's opinion, preferable to all others.

The following names are expreſſive of the eſſential character.

Adenanthera, Royen. (ἀδὴν, ἀδενος, a gland; and ἀνθηρὰ, the tops of the ſtamina) from its glandular tops.

Triopteris, Lin. (Τρεῖς, three, and πτερον, a wing) from each of its three ſeeds being furniſhed at top with an expanſion reſembling a wing.

Epilobium, Dillen. (ἐπι, upon, λοβος, a pod, and ἴον, a violet) from the flower being placed upon the *germen*, or ſeed-bud.

Helicteres, Lin. (ἑλιξ, a ſcrew) from its twiſted ſpiral fruit.

Tetracera, Lin. (Τεσσαρες, atticé, τετταρες, four, and Κερας, a horn) from the figure of its four capſules.

Trichoſanthes, Lin. (Θριξ, Τριχος, hair, and ἀνθος, a flower) from the petals ending in long branched hairs.

Greek generic names expreſſive of the habit are more frequent. The following liſt is chiefly of this kind.

Glycyrrhiza, Tourn. (γλυκυς, ſweet, and ῥιζα, a root) from the ſweetneſs of its root.

Ophiorrhiza, Lin. (ὀφις, a ſerpent, and ῥιζα, a root) from the convolutions of its root, reſembling thoſe of a ſerpent; or, more probably, from its pretended efficacy in curing the bites of ſerpents, and other venomous creatures.

Epidendrum, Lin. (ἐπι, upon, and δενδρον, a tree) from the plant growing naturally upon trees.

Leucadendron, Lin. (λευκος, white, and δενδρον, a tree) from the ſhining ſilver colour of the leaves.

Hæmatoxylum, Lin. (ἁιμα, blood, and ξυλον, wood) from the beautiful red colour of its wood.

Zygophyllum, Lin. (ζυγὸς, a yoke, and φυλλον, a leaf) from the leaves being, as it were, yoked together, two and two upon the ſame foot-ſtalk.

Hydrophyllum, Tourn. (ὕδωρ, water, and φυλλον, a leaf) from the cavities of the leaves in ſpring being filled with water.

Eriocaulon,

Eriocaulon, Gronovius, (ἔριον, wool, and καυλὸς, the ſtem) from its ſoft woolly ſtalks.

Eriocephalus, Dillen. (ἔριον, wool, and κεφαλη, the head) from its woolly leaves, which ſurround the ſtalks in cluſters.

Rhodiola, Lin. (ῥοδον, a roſe) from the ſmell of the roots, which reſembles that of the roſe.

Trigonella, Lin. (Τρεῖς, three, and γωνη, an angle) from its three cornered flower.

Crotalaria, Tourn. (κροταλον, a rattle) from the branches that are furniſhed with pods being uſed by the infant-Indians for rattles.

Rhizophora, Lin. (ῥιζα, a root, and φερω, to bear) from its branches bearing ſtringy roots, which penetrate into the earth or water.

Echinophora, Tourn. (εχῖνος, a hedge-hog, and φερω to bring, or bear) from its prickly fruit.

Eriophorum, Lin. (ἐριοφορος, bearing wool) from its fruit being furniſhed with long woolly hairs.

Acalypha, Lin. (καλος, beautiful, α, not, and ἁφη, touch) from the leaves, which ſting, like thoſe of nettles, upon being touched.

Alyſſum, Tourn. (ἀλυσσω, to be diſturbed in mind, to be mad) from its ſuppoſed efficacy in curing madneſs; whence, likewiſe, the Engliſh title of madwort.

Rhinanthus, Lin. (ῥιν, the noſe, and ἀνθος, a flower) from the upper lip of its gaping petal reſembling a noſe, or the proboſcis of an elephant.

Phyllanthus, Lin. (φυλλον, a leaf, and ἀνθος, a flower) from the flowers being produced upon the edges and under-ſide of the leaves.

Helianthus, Lin. (ἥλιος, the ſun, and ἀνθος, a flower) from the obvious reſemblance of its large flower to the diſk or body of the ſun; the florets in the circumference reſembling the rays of that luminary.

Calophyllum, Jacquin. (καλος, beautiful, and φυλλον, a leaf) from the beauty of the leaves.

Liriodendrum, Lin. (λείριον, a lily, and δενδρον, a tree) from the

the fancied reſemblance of its flowers to thoſe of the lily.

Rhododendron, Lin. (ῥοδον, a roſe, and δενδρον, a tree) from the reſemblance of its flowers to thoſe of the roſe.

Myriophyllum, Vaillant. (μυριος, infinite, and φυλλον, a leaf) from its numerous leaves.

Chryſanthemum, Tourn. (χρυσος, gold, and ἀνθος, a flower) from the yellow colour of the florets.

Chryſocoma, Lin. (χρυσος, gold, and κομη, a buſh of hair) from the foot-ſtalks being terminated with a head of flowers of a bright yellow colour.

Ophioglosſum, Tourn. (ὀφις, a ſerpent, and γλωσσα, a tongue) from the fancied reſemblance of its jointed ſpike of flowers to an adder's or ſerpent's tongue.

Cynogloſſum, Tourn. (κύων, κύνος, a dog, and γλῶσσα, a tongue) from the leaves reſembling, in figure, a dog's tongue.

Podophyllum, Lin. (πους, ποδος, a foot, and φυλλον, a leaf) from its bearing that particular kind of leaf called by Linnæus, foot-ſhaped.

Chryſophyllum, Lin. χρυσος, gold, and φυλλον, a leaf) from the leaves being of a beautiful gold-colour on their under-ſide.

Chærophyllum, Tourn. (χαίρω, to rejoice, and φύλλον, a leaf) from the exhilarating quality of the leaves.

Hæmanthus, Tourn. (ἁιμα, blood, and ἀνθος, a flower) from the beautiful-red colour of the flower.

Amaranthus, Tourn. (ἀ, not, and μαραινω, to wither) from its flower not ſpeedily withering after being cropped.

Cephalanthus, Lin. (κεφαλη, a head, and ἀνθος, a flower) from the branches being terminated with ſmall bunches or heads of flowers.

Chionanthus, Royen. (χιων, ſnow, and ἀνθος, a flower) from the beautiful whiteneſs of its flowers.

Galanthus, Lin. (γαλα, milk, and ἀνθος, a flower) from the milky whiteneſs of its flowers.

Melianthus, Tourn. (μελι, honey, and ἀνθος, a flower) from the flower being filled with a ſweet ſubſtance like honey.

Chryſobalanus,

Chryſobalanus, Lin. (χρυσὸς, gold, and βαλανὸς, a plumb, or cherry) from the red, or yellow colour of its fruit.

Lithoſpermum, Tourn. (λίθος, a ſtone, and σπέρμα, a ſeed) from its hard ſtony ſeeds.

Ceratocarpus, Buxbaum. (κέρας, a horn, and καρπὸς, fruit) from its capſule or ſeed-veſſel and ſeeds being furniſhed with an appearance like two horns.

Melampyrum, Tourn. (μέλας, black, and πυρὸς, wheat) from the colour of its ſeeds or grains, which, in form, reſemble thoſe of wheat.

Oſteoſpermum, Lin. (ὀστεον, a bone, and σπέρμα, a ſeed) from its hard bony ſeeds.

Conocarpus, Jacquin. (κῶνος, a cone, and καρπὸς, fruit) from its ſeed-buds being collected into a cone.

Tragopogon, Tourn. (τράγος, a goat, and πώγων, a beard) from the reſemblance of its ſeeds covered with the *pappus* or down to a goat's-beard.

Nyctanthes, Lin. (νὺξ, the night, and ἄνθος, a flower) from the flowers opening at night, and falling in the morning.

Melanthium, Lin. (μέλας, black, and ἄνθος, a flower) from the colour of the flower, which is a dark brown.

Agave, Lin. (ἀγαυὸς, admirable) from its ſuperb and beautiful appearance.

Erythronium, Lin. (ἐρυθρὸς, red, and ἴον, a violet) from the beautiful colour of its flowers.

Clematis, Lin. (κλῆμα, a little vine, a climber) from its ſupporting itſelf, like the vine, upon the bodies in its neighbourhood.

Gnaphalium, Vaillant. (γνάφαλον, the fine white downy appearance to be obſerved on the ſurface of many plants) from its ſoft downy leaves and ſtalks.

Aſter, Tourn. (ἀστὴρ, a ſtar) from the figure of the flower.

Hypecoum, Tourn. (ὑπηχέω, to reſound) from the ſeeds being thrown out of their jointed pod, or capſule, with velocity and a conſiderable noiſe.

Oxalis, Lin. (ὀξὺς, ſour) from the acidity of its leaves.

Parthenium, Lin. (παρθενος, a virgin) from its efficacy in diforders of the womb.

Helistropium, Tourn. (ἥλιος, the fun, and τρεπω, to turn) from the flower always turning its difk to the fun, and following its direction.

Leucoium, Ruppius. (λευκὸς, white, and ἴον, a violet) from the beautiful whitenefs of the flower.

Ipomœa, Lin. (ἴψ, ιπος, the flower called convolvulus, and ὁμοιὸς, like) from the great refemblance of its flower to that of convolvulus, or bind-weed.

Bunias, Lin. } (βυνος, a little hill) from the native foil of
Bunium, Lin. } the plants.

Sideroxylum, Dillen. (σιδηρος, iron, and ξυλον, wood) from the hardnefs and firm texture of the wood, which is fo weighty as to fink in water.

Aphanes, Lin. (ἀφανὴς, not confpicuous) from the minutenefs, and low ftature of the plant.

Pteris, Lin. (πτερὸν, a wing) from the divifions of the fmaller leaves refembling wings.

Lythrum, Lin. (λυθρον, blood, gore) from the deep purple colour of the flowers.

Orchis, Tourn. (ὀρχις, a tefticle) from the fancied refemblance of its roots.

Cotyledon, Tourn. (κοτὺλη, a cavity) from the leaves being hollowed, like the navel.

Phallus, Micheli (φαλλος, the yard) from the peculiar figure of this mufhroom.

Xeranthemum, Tourn. (ξηρὸς, dry, and ἀνθος, a flower) from the extreme drynefs of the petals; a circumftance which preferves the beauty of the flowers for many months. Hence it is termed, in Englifh, everlafting, or the eternal flower.

Adoxa, Lin. (ἀ, not, and δόξά, glory) from its diminutive appearance and want of beauty.

Anthoxanthum, Lin. (ἀνθος, a flower, and ξανθος, yellow,) from the yellowifh colour of the fpike of flowers.

Sphæranthus, Vaillant. (σφαῖρα, a fphere, or globe, and ἀνθος, a flower) from its globular head of flowers.

Siphonanthus,

Siphonanthus, Lin. (σιφων, a ſyphon, or tube, and ἀνθος, a flower) from its long tubular petal.

Meſembryanthemum, Dillen. (μεσος, the middle, ἡμερα, a day, and ἀνθος, a flower) from the flowers of this genus opening in the middle of the day. Linnæus derives it from the flower being ſeated upon the germen, or ſeed-bud, in Greek, ἐμβρύων. Either etymology is expreſſive of a characteriſtic of the genus in queſtion.

Sideritis, Tourn. (σιδηρος, iron) from the plants of this genus being vulnerary, and of eſpecial efficacy in wounds made by the ſword.

Camphoroſma, Lin. (ὀσμη, a ſmell) from its having the ſmell of camphire.

Polypodium, Tourn. (πολυς, many, and πους, a foot) from its roots ſerving the office of feet, by penetrating into whatever they can lay hold of, and thus ſupporting the plant.

Aſplenium, Lin. (ἀ, priv. and σπλην, the ſpleen) from its efficacy in diſeaſes of the ſpleen.

Dioſma, Lin. (ζευς, διος, Jupiter, and ὀσμη, a ſmell) from the very agreeable odour of the plants of this genus.

Dracontium, Lin. (δρακων, a dragon) probably from the protuberances of the ſtalks, which are of different colours, and ſhine like the body of a ſerpent.

Echium, Tourn. (ἐχις, a viper) from its ſeeds when ripe reſembling the head of a viper.

Geranium, Tourn. (γερανος, a crane) from the fancied reſemblance of its permanent ſtyle to a crane's bill.

Hieracium, Tourn. (ἱεραξ, a hawk) from a vulgar opinion that the juice of theſe plants is uſed by hawks to remove any occaſional films from the eyes of their young.

Cardioſpermum, Lin. (καρδια, the heart, and σπερμα, a ſeed) from the ſeeds being marked at the baſe with a heart.

Heliocarpos, Lin. (ἡλιος, the ſun, and καρπος, fruit,) from the reſemblance of the threads which ſurround the borders of the capſule to the rays of the ſun.

Trichoſtema, Gronovius, (θριξ, τριχος, a hair, and στημων, a ſtamen, or thread) from its long ſlender ſtamina reſembling hairs.

Dianthera, Gronovius. (δις, twice, and ἀνθηρα, the top of the

the stamen) from its having two *anthers* upon each filament.

Elæocarpus, Burman. (ἐλᾶια, an olive, and καρπ⊗, fruit) from the resemblance of its fruit to that of an olive.

Buphthalmum, Tourn. (βȣς, an ox, and ὀφθαλμὸς, an eye) from the fancied resemblance of its large compound flower to that of an ox-eye.

Dracocephalum, Tourn. (δράκων, a dragon, and κεφαλὴ, the head) from the figure of the flower.

Diospyros, Lin. (ζευς, διὸς, Jupiter, and πυρ⊗, wheat) from the excellence of the plant.

Dipsacus, Tourn. (διψάω, to thirst) probably from the leaves collecting water in their cavities, and thus preventing the injuries which might arise to the plant from aridity.

Stachys, Tourn. (στάχυς, a spike, or ear of corn) from its flowers being produced in long spikes.

Ceratonia, Lin. (κεράτιον, a pod, ἀ Κερας, *cornu, quia siliqua est quasi corniculata*) from its bearing pods. It was formerly termed *siliqua*, the pod by way of eminence; Linnæus has changed that name for a Greek one of the same import.

Platanus, Tourn. (πλατυς, large, ample) from the great dimensions of the trees of this genus.

Tribulus, Tourn. (τρίβολοι, caltrops,) from its prickly fruit.

Thlaspi, Tourn. (θλαω, to compress, to squeeze together) from its flat compressed seed-vessel.

Panax, Lin. (πᾶν, every, and ἄκ⊗, a medicine or remedy) from its boasted efficacy in medicine.

Iatropha, Lin. (ἰατρὸς, a physician, and φάγω, to eat) from the plant being used both for food and physic.

Capsicum, Tourn. (καπτω, to bite) from its hot acrid quality.

Azalea, Lin. (ἀζαλέ⊗, dry, torrid) from its delighting in a dry parched soil.

Origanum, Tourn. (ὀρ⊗, a mountain, and γάν⊗, delight, joy) from its native soil.

Typha, Tourn. (τιφ⊗, a marsh) from its growing naturally on wet boggy ground.

Cypripedium,

Cypripedium, Lin. (κύπρις, one of Venus's names, and ποδίον, a ſhoe, or ſlipper) from the obvious reſemblance of the nectarium of the flower to a ſlipper.

Delphinium, Tourn. δελφὶν, a dolphin) from the fancied reſemblance of the flowers, before expanſion, to the fiſh called a dolphin.

Hyoſcyamus, Tourn. (ὗς, a ſwine, and κύαμος, a bean) *quaſi* hog-bean.

Hippomane, Loefling. (ἵππος, a horſe, and μανία, madneſs) from the noxious quality of the plants of this genus.

Hippocrepis, Lin. (ἵππος, a horſe, and κρηπις, a laſt, likewiſe a horſe-ſhoe) from each joint of the pod reſembling a horſe-ſhoe.

Tragacantha, Tourn. (τράγος, a goat, and ἄκανθα, a thorn) from the plants being armed with long ſharp thorns.

Chelone, Tourn. (χελώνη, a tortoiſe) from the figure of its ſeeds, which are round, compreſſed, and begirt with a membranaceous rim, or border.

Bupleurum, Tourn. (βοῦς, an ox, or cow, and πλευρὸν, a rib, ſide, or breaſt) from a vulgar opinion that theſe plants burſt the bellies of cows, which eat of them.

Chryſoſplenium, Tourn. (χρυσὸς, gold, and σπλὴν, the ſpleen) from the flowers being of a golden colour, and of ſuppoſed efficacy in diſeaſes of the ſpleen.

Adianthum, Tourn. (ἀ, not, and διαίνω, to wet, or moiſten) probably from its growing out of the clefts of rocks, and in a ſandy ſoil, ſo as not to require any quantity of moiſture.

Æſchynomene, Lin. (αἰσχύνομαι, to be aſhamed, or ἴσχω, to contract) from its reſemblance to the ſenſitive plant, which is ſometimes diſtinguiſhed by this appellation.

Mimoſa, Tourn. (μῖμος, a mimic) from its imitating the motions of animals.

Polygala, Tourn. (πολὺ, much, and γάλα, milk) from its increaſing the quantity of milk to cows which feed on it.

Galium, Tourn. (γάλα, milk) from the property poſſeſſed by ſome plants of this genus, of coagulating milk.

Poterium, Lin. (ποτήριον, a cup, or bowl) from its being put

put into cool tankard in ſummer, to give the wine an agreeable flavour.

Picris, Lin. (πικρὸς, bitter) from its bitter taſte.

Glycine, Lin. (γλυκὺς, ſweet) from the leaves having a ſweet taſte like that of liquorice.

Rheum, Lin. (ῥεω, to flow) from its purgative quality.

Aizoon, Lin. (ἀεί, always, and ζωον, alive) from its duration.

Ornithopus, Lin. (ὄρνις, a bird, and πυς, a foot) from its bended and pointed pods exactly reſembling the toes of a bird's foot.

Aconitum, Tourn. (ἀκονη, a cliff, a rugged rock) from its native ſoil.—Thus Ovid, in ſpeaking of the venomous potion prepared for Theſeus by Medea, from the plant produced by the white froth (*ſpumæ albentes*) of Cerberus, gives this etymology of its name,

> " Quæ quia naſcuntur dura vivacia caute,
> " Agreſtes ACONITA vocant."
>
> Metam. Lib. VII. 418.

From the above liſts are excluded ſuch names as are not of obvious origin, and where the etymology, though ſufficiently perſpicuous, is not expreſſive of any ſtriking character or circumſtance in the genus in queſtion. Perhaps there is ſome degree of impropriety in having dwelt ſo long upon a barren and unentertaining ſubject like that of names: but, as the preſent work is chiefly deſigned for the uſe of the unlearned botaniſt, an explanation of the modern generic nomenclature ſeemed, in ſome ſort, neceſſary, as, however liable to cenſure, it bids fair to be permanent.

XIX. Generic names of an immoderate length, or of difficult and harſh pronunciation, are, by all means, to be avoided. For theſe reaſons Linnæus has very properly changed the

Kalophyllodendron —		Calophyllum.
Stachyarpogophora —	of	Celoſia.
Caraxeron — —	Vaillant,	Gomphrena.
Myrobatindum —	for	Lantana.
Hydroceratophyllon —		Ceratophyllum.

Micro-

Microleuconympha — *Hypophyllocarpodendron*	of Boerhaave, for	Hydrocharis. Leucadendron.

Coriotragematodendros	of Plukenet, for	Myrica.
Orbitochortus — —	of Knaut, for	Fagonia.

Eupatoriophalacron — *Galeobdolon* — —	of Dillenius, for	Verbesina. Galeopsis.

Pterospermadendron —	of Ammannus, for	Pentapetes.
Acrochordodendros —	of Plumier, for	Cephalanthus.

XX. Terms of art are not to be used as generic names. Hence Linnæus has changed

Tuberosa — —	for	Polianthes.
Spica — — —	for	Lavandula.
Siliqua — —	for	Ceratonia.
Nux — — —	for	Iuglans.
Odorata — —	for	Scandix.

XXI. Generic names, which are not of Greek or Latin origin, are, according to Linnæus, to be excluded from the nomenclature of botany. This rule, which indeed serves as a foundation to all the others, has been severely criticised by some modern authors. It has been said that the term barbarous, which Linnæus applies to all the Indian, African, American, and foreign names of genera, may, with equal justice, be applied, by those nations, to our learned European names, which to them are as little expressive of the essential character, or habit of the plants in question, as theirs are to us: that they ought, therefore, to be deemed equivalent to the Greek and Latin names, and be adopted, unless when immoderately long, or of harsh and difficult pronunciation. The same authors have disputed the necessity of employing generic names expressive of any character or circumstance in the parts of plants, much more of burdening the nomenclature with a profusion of names in honour of botanists, unless where the merit of the man has been so

ſo univerſally conſpicuous, that his name is ſufficient elogium.

In anſwer to theſe cenſures it has been urged, that the Latin and Greek languages being univerſally ſtudied all over Europe, and by the liberal, in all quarters of the world, generic names, derived from thoſe languages, very properly ſerve as a ſtandard to which the vernacular names of each country may be eaſily referred: that to form a genus of every plant diſcovered in each different quarter of the world, would be to multiply genera without end, or, in other words, to confound genera and ſpecies: that a genus is an abſtract term, implying the ſimilitude of a number of ſpecies: that ſuch ſimilitude, therefore, ought, if poſſible, to be expreſſed in the title or common name allotted to each genus: that, in fine, the vernacular names of Indian, American, and African plants, are frequently retained, not, indeed, as generic, but as ſpecific trivial names, which, in fact, is the very thing contended for—as the genera in queſtion, if ſtrictly admitted, would rarely conſiſt of more ſpecies than one.

Among the generic names, termed by Linnæus barbarous, and which have been changed for others of Greek or Latin etymology, are the following:

Boviſta — — —	of Dillenius, changed for	Lycoperdon.
Percepier — —		Aphanes.
Brunella — —	of Ray, for	Prunella.
Beccabunga — —		Veronica.
Caapeba — — —	of Plumier, for	Ciſſampelos.
Iabotapita — —		Ochna.
Nhandiroba — —		Feuillea.
Courbaril — — —		Hymenæa.
Kodda-pail — —		Piſtia.
Icaco — — —		Chryſobalanus.
Cainito — — —		Chryſophyllum.
Karatas — — —		Bromelia.

Papaya.

Papaya — — —	of Plumier, for	Carica.
Bonduc — — —		Guilandina.
Cujete — — —		Crescentia.
Rojoc — — —		Lantana.
Monbin — — —		Spondias.
Sapota — — —		Achras.
Calaba — — —		Calophyllum.
Tapia — — —		Crateva.
Mancanilla — —		Hippomane.
Mangles — — —		Rhizophora.
Arapabaca — —		Spigelia.
Caraguata — —		Tillandsia.
Ceiba — — —		Bombax.

Agialid — — —	of Prosper Alpinus, for	Ximenia.
Baobab — — —		Adansonia.

Azedarac — — of Avicenna, for Melia.

Belamkanda — —	of the Hortus Malabaricus, for	Ixia.
Upata — — —		Avicennia.
Cadelàri — — —		Achyranthes.
Carambola — —		Averrhoa.

Mays — — —	of Tournefort, for	Zea.
Cacao — — —		Theobroma.
Ketmia — — —		Hibiscus.
Alhagi — — —		Hedysarum.
Adhatoda — —		Justicia.
Guajava — — —		Psidium.
Alkekengi — —		Physalis.
Acajou — — —		Anacardium.
Ahouai — — —		Cerbera & Thevetia
Manihot — — —		Iatropha.
Muscari — — —		Hyacinthus.

The following genera are retained by Linnæus in contradiction to this rule. *Orvala*, *Scorzonera*, *Galega*, *Datura*, *Ribes*,

Ribes, Doronicum, Thea, Coffea, Caffine, Annona, Mammea, Chara, Pothos, Bafella, Hura, Yucca, Guaiacum.

Names of the Species.

Since the time of Cafpar Bauhin, the different fpecies of plants have been diftinguifhed by certain fhort defcriptions, or phrafes, expreffive of fome circumftance in their external form or habit. Thefe defcriptions, which have been very improperly denominated fpecific names, Linnæus has fubjected to the fame rules with the names of claffes and genera. The effential difference of each fpecies is to be expreffed in the name or definition, which is intended to difcriminate the fpecies in queftion from all the plants of the fame genus, and from none others.

The defcription of the fpecies termed the fpecific name, and which, in Linnæus's opinion, ought never to exceed twelve words, is preceded by the trivial name, which always confifts of one word placed after the generic name, and is not fubjected to the fame conftraint as the names of the claffes and genera, and defcriptions of the fpecies. In the following examples the generic name is marked in fmall capitals, the fpecific in Roman characters, the trivial in Italic.

Generic name. Trivial name.	*Specific name.*
RHODODENDRON *ferrugineum.*	RHODODENDRON foliis glabris fubtus leprofis, corollis infundibuliformibus.
PYROLA *fecunda.*	PYROLA racemis unilateralibus.
PYROLA *umbellata.*	PYROLA pedunculis fubumbellatis.
PYROLA *uniflora.*	PYROLA fcapo unifloro.
MAGNOLIA *grandiflora.*	MAGNOLIA foliis lanceolatis perennantibus.
MAGNOLIA *glauca.*	MAGNOLIA foliis ovato-oblongis fubtus glaucis.

Generic name. Trivial name.	*Specific name.*
HEBENSTRETIA *dentata.*	HEBENSTRETIA foliis dentatis.
HEBENSTRETIA *cordata.*	HEBENSTRETIA foliis fubcarnofis, cordatis, feffilibus.
PYRUS *Malus.*	PYRUS foliis ferratis, umbellis feffilibus.
PYRUS *Cydonia.*	PYRUS foliis integerrimis, floribus folitariis.

From the firft, third, fourth, fixth, feventh and eighth of the above examples, it is evident that the trivial name is frequently an abbreviation of the fpecific; and as this laft contains the effential difference, where fuch difference is confpicuous, the trivial name is an abridgment of that difference, where fuch abridgment can be conveniently contained in one word.

When two or three genera of former authors are abforbed by one, it is common to fee the names of thofe genera retained as trivial names. Thus, in the two laft examples, MALUS and CYDONIA, two genera of Tournefort, are converted into trivial names, for characterizing the moft common fpecies of each refpective genus. Such trivial names have always a capital for their initial letter.

The diftinction of fpecific and trivial names fuggefted by Linnæus deferves particular attention, the rather as many circumftances, deemed improper for entering into the defcription, or fpecific name, are employed without referve for the trivial.

So extraordinary a meafure required fome explanation: but Linnæus has thought fit to be filent on that head. He has judged very properly; for no fatisfactory reafon could be affigned for fo glaring an inconfiftency.

In fact, what can be more abfurd, than to characterize a plant by a circumftance, which is either accidental and inconftant, or, at beft, deemed unworthy of a place in its defcription! yet, half the trivial names in the *Species Plantarum* are

are of this kind. Not that these names are totally to be rejected; many of them being highly proper and significant; but we must disapprove and condemn the sophistry of Linnæus, who would excuse, and even applaud, in himself, what he so severely censures in others.

This being premised, we proceed to lay down Linnæus's general principles or aphorisms on this subject.

I. Genuine specific differences are afforded by the root, trunk, leaves, fulcra, mode of flowering, and such circumstances of the parts of fructification as are unconnected with the generical description.

II. The specific name ought to be expressive of characters inscribed, as it were, upon the plant itself. All accidental marks, therefore, not existing in the plant, or not conspicuous in its appearance, are to be excluded from the specific difference.

III. Magnitude being subject to variations, from place, soil, climate, and other circumstances, is not to enter into the specific difference.

IV. Specific names are by no means to be employed, which pre-suppose a knowledge of other species of a different genus. Former botanists, says Linnæus, constructed their specific differences in such a manner, as if those for whom they wrote had been previously acquainted with most of the European plants. Their descriptions are frequently comparisons of the plants in question with those of their own country. Thus such a plant had a hawk-weed leaf; another had the leaf of the willow; a third of groundsel; one had the appearance of balm; another of wormwood. Such characters Linnæus disclaims. A plant, in his opinion, ought to be known by the name assigned to it; and the name to be suggested by the appearance of the plant. Each is to be discovered by its proper character, written in the one, delineated in the other. Names, he continues, pre-supposing other plants, have always a tendency to lead those who use them into an error similar to what Logicians call *committing the circle.*

Notwithstanding this shew of reasoning, I believe it will be

be found that ſpecific differences from compariſon with plants, or the parts of plants, generally known, make a much ſtronger impreſſion, and lead more directly to the knowledge required, than the moſt accurate deſcription of characters exiſting in the plant itſelf.

V. Specific names, pre-ſuppoſing a knowledge of other ſpecies of the ſame genus are, for the ſame reaſon, proſcribed from the modern nomenclature of botany. Hence the following names are cenſured by Linnæus,

Orchis flore *candidiſſimo*, Tourn.

Campanula *anguſtifolia*, *magno* flore, minor, Tourn.

Campanula, flore *minore*, *ramoſior*, Moriſon.

A beginner is not ſuppoſed to know of any ſpecies of campanula, that is leſs branched, or of orchis, whoſe flowers are leſs white. Such names too, from their very nature, are fluctuating. In fact, the eſtabliſhment of ſpecific names upon a ſolid foundation, muſt be preceded by a knowledge of all the ſpecies of any particular genus. For as the eſſential difference of any ſpecies manifeſtly implies a character peculiar to that ſpecies, and which does not exiſt in any of its congeners; it is evident that the diſcovery of a new ſpecies poſſeſſing a common character, muſt bring the eſſential difference in queſtion to an end.

To illuſtrate this by an example. The eſſential character of a ſpecies of winter-green is deſcribed by Linnæus to be a naked ſtalk ſupporting a ſingle flower. By this deſcription the ſpecies in queſtion is eſſentially diſtinguiſhed from all the ſpecies of winter-green yet known. But, ſuppoſing another ſpecies ſhould be diſcovered with a naked ſtalk and a ſingle flower, the ſpecific name juſt mentioned would no longer be an eſſential difference; another muſt be ſubſtituted; and that, perhaps, in conſequence of further diſcoveries, muſt give place to a third. This obſervation ſufficiently accounts for the numerous alterations in every edition of the *Species Plantarum*; and has almoſt convinced me of the neceſſity of employing proper ſpecific names, not expreſſive of any eſſential difference whatever, nor, of conſequence,

ſequence, ſubject to continual variation from future diſcoveries.

VI. The name of the diſcoverer or deſcriber of any plant is not to enter into the ſpecific difference. On this account, the following ſpecific names are rejected from the modern nomenclature.

Trifolium *gaſtonium* of Moriſon.
Gramen cyperoides *Bœlii* of Lobelius.
Conyza tertia *Dioſcoridis* of C. Bauhin.
Conyza media *Matthioli* of I. Bauhin.
Narciſſus *Tradeſcantii* of Rudbeckius.

The following are liable to cenſure for a ſimilar reaſon.

Sideritis *Valerandi Dourez* } of I. Bauhin.
Campanula a *Toſſano Carolo* miſſa }
Mimoſa à Domino *Hermans* miſſa of Breynius.
Amanita *Divi Georgij* of Dillenius.
Chamæpithys flore pluſquam eleganti, ſeu *Pluſqueneti*, } of Plukenet.
Eriocephalus *Bruniades*, }

VII. The place of growth, or native ſoil of any plant is not an eſſential character; and, therefore, ought to make no part of the ſpecific difference. No one, ſays Linnæus, would chuſe to make a voyage to Japan, the Cape of Good Hope, or Peru, to be ſatisfied of the accuracy of the deſcription of a plant. Beſides, the ſame ſpecies is often produced in very different ſoils, and in regions the moſt diſtant from one another. The Alpine plants are not rarely found in the fens; nay, Lapland, Siberia, Canada, Aſia, and America, frequently produce the ſame individual ſpecies.

Improper, however, as the circumſtances of ſoil, and place of growth, are deemed in a ſpecific deſcription, Linnæus has not ſcrupled, however inconſiſtently, to employ them upon ſeveral occaſions in denominating the ſpecies. I ſaid, however inconſiſtently; for if the ſoil, by reaſon of its being an accidental and variable circumſtance, is deemed unworthy a place in the ſpecific difference, how can it, with any propriety, enter into the abridged deſcription, or trivial name?

name? If a plant, which is a native of two very remote countries, as Guinea and Japan, cannot have its place of growth expreſſed in the deſcription, is it proper to miſlead the ignorant, by ſignifying in the title, or trivial name, that the plant in queſtion is the produce of one particular country only, when, for the very oppoſite reaſon, its place of growth could not be mentioned in the ſpecific deſcription?

VIII. The time of flowering, duration, colour, taſte, ſmell, and powers of plants, are very fallacious marks of diſtinction, and, therefore, to be totally excluded from the ſpecific name.

IX. The generic name is to be applied and prefixed to each particular ſpecies, that the genus, as well as ſpecies, may be ſignified by the deſcription, or ſpecific name. Indeed, without the name of the genus, the ſpecific difference is of no ſignificancy. A mutilated deſcription of that kind may be applicable to a hundred different plants, as the eſſential characters of the ſpecies are only intended to diſcriminate plants of the ſame genus, and may, therefore, be frequently poſſeſſed in common by plants of a different genus. To aſcertain, therefore, the plant in queſtion, beyond the poſſibility of a miſtake, let the generic name be prefixed to each ſpecies, and announced with it. Moriſon and Ray, although they reduced the ſpecies under their reſpective genera, were ſeldom careful to adopt the generic name, but ſubſtituted a kind of proper ſpecific name in its ſtead; ſo that a quotation from either of theſe authors, not ſuggeſting an idea of the genus, becomes only intelligible by being conſulted in their reſpective works. Thus to take an example from Ray. Under the generical name STOECHAS are arranged the following ſpecies.

I. *Stoechas citrina germanica, latiore folio.*
II. *Chryſocome Æthiopica, plantaginis folio.*
III. *Helichryſum abrotani feminæ foliis.*
IV. *Helichryſum creticum.*
V. *Stoechadi citrinæ alteri inodoræ Lobelij affinis.*
VI. *Gnaphalium montanum album.*

Of theſe ſix ſpecies, the firſt only, and perhaps the fifth, is exempted from cenſure, as containing both the generic

 and

and specific name: the rest, when viewed apart, would seem to have no connection with the genus under which they are arranged; but, on the contrary, appear to belong to other genera, *chrysocome*, *helichrysum*, and *gnaphalium*, with which, in reality, they have no affinity.

Again, the generic name is not only to be applied, but to be prefixed to each species. The following specific names of Lobelius are faulty in this respect.

Minus heliotropium *repens*
Matthioli secundum limonium.
Aquatica plantago *foliis betæ*.

X. Specific names are, if possible, to exhibit the essential difference of each species. Where the essential characters of any species have not been investigated, other differences, less essential, but more numerous, are to be substituted in their place. Specific names of the latter kind are termed by Linnæus, synoptical, and are not to be admitted, unless in default of the essential name. The merits of each will best appear from comparison.

Synoptic name—Salix *foliis serratis glabris ovatis acutis subsessilibus* of Royen.
Essential name—Salix *flosculis pendandris*, Lin. Flor. Lap.
Synoptic name—Salix *foliis subintegerrimis lanceolato-linearibus longissimis acutis, subtus sericeis*; *ramis virgatis*. Flora Suecica.
Essential name—Salix *foliis linearibus revolutis*.

From these examples it appears that the essential name consists of but two or three words, and is generally expressive of a single idea. We have seen, however, that even essential specific names, however excellent when compared with those termed synoptic, must always be inconstant, as long as a single species of any genus remains undetected. Indeed, were that obstacle removed, and every species characterized by an essential name, I should most heartily concur with Linnæus, that the science, at least, in one point, had reached perfection; but till that distant day arrive, and a distant day it must be from the very nature of things, we must rest satisfied with ascribing to those essential names, a degree of merit proportioned to their stability.

XI. The excellence of the ſpecific name, according to Linnæus, conſiſts in its brevity. In this reſpect chiefly, the eſſential name, as containing a ſingle idea, is preferable to the ſynoptical, in which the characters are numerous, but not ſtriking. After all, it may be doubted, whether the ample deſcriptions of former authors, however ſeverely cenſured by certain moderns, are not ſuperior, in point of merit, to the ſhort phraſes, or ſpecific differences, which are now ſo generally adopted; as theſe are not deſcriptive of any ſpecies conſidered by itſelf, but ariſe from a view of its reſemblances and contraſts with others.

I cloſe the ſubject of ſpecific names with obſerving, that the differences in queſtion are not always uniform; I mean, that the ſame idea does not predominate in the eſtabliſhment of the ſpecies of any genus, the characters being ſeldom relative, or drawn from the ſame parts: in fine, that a compariſon of oppoſition or contraſt, is rarely either inſtituted or implied. This fault we muſt pronounce a capital one; and every page of the *Species Plantarum* affords ſtriking evidences of its exiſtence. The following are examples of the impropriety alluded to.

I. LYTHRUM *foliis linearibus alternis, floribus hexandris.*
LYTHRUM *foliis linearibus alternis, floribus tetrapetalis.*
II. COTYLEDON *foliis laciniatis, floribus quadrifidis.*
COTYLEDON *foliis oblongis ſubteretibus, floribus faſciculatis.*
III. SEDUM *foliis quaternis.*
SEDUM *foliis planiuſculis ſerratis.*

The want of uniformity complained of will be beſt underſtood, by contraſting the above examples with a few ſpecific names of the ſame author, in which the oppoſition alluded to is carefully preſerved.

I. ROYENA *foliis lanceolatis glabris.*
ROYENA *foliis lanceolatis hirſutis.*
II. SCLERANTHUS *calycibus fructus patulis.*
SCLERANTHUS *calycibus fructus clauſis.*
III. LILIUM *foliis ſparſis, corollis campanulatis, intus glabris.*
LILIUM *foliis ſparſis, corollis campanulatis, intus ſcabris.*

A compariſon of theſe two oppoſite ſets of examples, will

will convince the reader of the excellence of the uniformity recommended, and render any further illuſtration unneceſſary.

Names of the Varieties.

Varieties being only occaſional modifications of the ſame ſpecies, the circumſtance which conſtitutes the variety in any ſpecies is to be placed immediately after the ſpecific name. Such circumſtance, however, for the ſake of diſtinction, ſhould be delineated in a different character; in like manner as the ſpecific name ſhould ſtand diſtinguiſhed from the generic. A few examples will illuſtrate the obſervation in queſtion.

CONVALLARIA ſcapo nudo; *corolla plena.*
CONVALLARIA ſcapo nudo; *corolla rubra.*
SAXIFRAGA alpina ericoides; *flore purpuraſcente.*
SAXIFRAGA alpina ericoides; *flore cœruleo.*

In the above examples, the generic name is marked in ſmall capitals; the ſpecific in Roman characters; and the name of the variety in italics: a diſtinction which is abſolutely neceſſary, to prevent the variable circumſtance from being confounded with the ſpecific difference. The ſame ſpecies of lily of the valley has ſometimes a red, ſometimes a full flower. This occaſional difference does not enter into the ſpecific name; it is expreſſive of a variety, and ought to be diſtinguiſhed as ſuch.

NUCAMENTUM. *Vide* AMENTUM.

NUDUS *Flos*, a naked flower; a flower ſo termed by Vaillant which wants the *calyx*, or flower-cup, but not the petals. The term, perhaps, would have been more properly applied to a flower wanting both calyx and petals, which are properly the cloathing or covers of the flower. Inſtances, however, of entire nakedneſs in flowers are very rare.

NUX, a nut; a ſpecies of ſeed, according to Linnæus, covered by a hard bony ſhell. The incloſed ſeed is termed the *nucleus*, or kernel.

OCTAN-

O.

OCTANDRIA, (ὀκτω, eight, and ἀνηρ, a man, or husband) the eighth clafs in Linnæus's Sexual Syftem; confifting of plants with hermaphrodite flowers, which are furnifhed with eight ftamina, or male organs of generation.

The orders, or fecondary divifions of this clafs are four, and derive their names from the number of female organs poffeffed by the plants of each refpective divifion.

French-willow, Indian-crefs, heath, and tree-primrofe have one ftyle, or female organ.

Galenia, *weinmannia*, and *moehringia*, have two ftyles.

Biftort and heart-feed have three ftyles; tuberous mofchatel and one-berry, four.

OCULUS, an eye, a fpecies of bud. *Vide* GEMMA.

ODOR, fmell; the weakeft and moft obfcure of the fenfes, as being different in almoft every object, and variable in each. Dogs trace their mafters with furprifing facility at one time, and lofe them with equal facility at another.

The ancients, according to Ariftotle, recognized feven primitive or original fmells, which, on account of their ftriking affinity to the fimple taftes, were defigned by the fame names.

Smells being fo extremely variable, admit of no determinate limits, and are, therefore, never to be employed in difcriminating the fpecies of plants. Hence fuch fpecific names as the following are very properly profcribed from the modern nomenclature of botany.

Hypericum *hircinum* (rank-fmelling).
Melo *mofchatus* (fmelling of mufk).
Hefperis *noctu olens* (fmelling in the night).
Caryophyllus *inodorus* (without fmell).
Ocymum *caryophyllatum*, C. Bauhin, (fmelling of cloves).
——— *citri* odore (fmelling of citron).
——— *anifi* odore (fmelling of anife).
——— *fœniculi* odore (fmelling of fennel).
——— *meliffæ* odore (fmelling of balm).
——— *rutæ* odore (fmelling of rue).

Ocymum *cinnamomi* odore (ſmelling of cinnamon).

For obſervations on ſmell, as indicative of the virtues and qualities of plants, the reader is referred to the article of taſte, between which, and ſmell, there is, as we have ſaid, a remarkable affinity. *Vide* SAPOR.

OLIGANTHERÆ (ὀλιγος, few; and ἀνθηρος, *floridus*, ab ἀνθος, *flos*) the name of the ſixteenth claſs in Royen's Natural Method, conſiſting of plants with hermaphrodite flowers whoſe ſtamina are leſs in number than the diviſions of the *corolla*, or equal to them. It includes ſeveral genera of the plain claſſes in the Sexual Method.

ORCHIDEÆ (orchis, the name of a well-known genus of plants). The ſeventh order in Linnæus's Fragments of a Natural Method, conſiſting of orchis, and the plants which reſemble it in habit, powers, and ſenſible qualities.

Liſt of the Genera *contained in this Natural Order.*

Linnæan Genera.			*Engliſh Names.*
Arethuſa.			
Cypripedium,	—	—	Ladies ſlipper.
Epidendrum,	—	—	Vanilla, or vanelloe.
Limodorum.			
Ophrys,	—	—	Bee-flower, bird's-neſt, twyblade.
Orchis.			
Satyrium,	—	—	Lizard-flower,
Serapias,	—	—	Helleborine, or baſtard-hellebore.

Habit and Structure of the Plants of this Order.

The ROOTS of many of theſe plants are compoſed of one or more fleſhy tubercles, attached to the lower part of the ſtem; and ſending forth fibres from the top. Thoſe of orchis bear an obvious reſemblance to the ſcrotum in animals; from which circumſtance the genus has derived its name.

The LEAVES are of a moderate ſize, inſcribed with a number of longitudinal nerves or ribs, and without any footſtalk. At their origin, they form, round the ſtalk, a kind of

of ſheath, which is long, entire, cylindrical, but not furniſhed, like the graſſes, and ſome other plants, with a crown at top. This ſheath is ſometimes wanting in the leaves that are placed towards the top of the ſtalk. In ſome ſpecies of bird's-neſt, the leaves prove abortive; the ſheaths which ſurround the ſtalk appearing like ſo many ſcales.

The FLOWERS are hermaphrodite, and placed at the ſummit of the ſtalk, either in a ſpike, as in ladies ſlipper, bee-flower, orchis, ſatyrium, *limodorum* and *arethuſa*; or in a panicle, that is, a looſe, diffuſed ſpike, as in vanelloe. Each flower is accompanied with a leaf that is ſmaller than the other leaves, and forms no ſort of ſheath round the ſtalk.

The CALYX in this order is that ſort termed by Linnæus a *ſpatha* or ſheath, that, burſting open, protrudes a head or cluſter of flowers termed the *ſpadix*, which have no *perianthium*, or proper flower-cup.

The PETALS are five in number, and very irregular. The two innermoſt frequently approach and form the figure of a helmet. The three outermoſt are larger, and nearly equal.

The NECTARIUM in this order is remarkably conſpicuous, yet ſo different in the different genera, that Linnæus has employed it for his principal character or mark of diſtinction, inſtead of the root, which had chiefly engaged the attention of former botaniſts. It has the appearance of a ſixth petal, and conſtitutes the lower lip of the helmet. In ſome ſpecies of *ophrys* it is ſhaped like a bee; whence the Engliſh title of bee-flower, which has been given to that genus. In *limodorum* it conſiſts of one piece, which is hollow, of the length of the petals, and placed within them. In *cypripedium* the appearance in queſtion is ſituated between the petals, and reſembles a wooden ſhoe or ſlipper; from which circumſtance it has derived both its ſcientific and Engliſh name. In orchis and ſatyrium, the *nectarium* conſiſts of two lips; the upper erect and very ſhort, the lower larger, hanging, and terminated behind by a tube, which, in the former, reſembles a horn, in the latter, the *ſcrotum* in animals. In *arethuſa* it is placed in the bottom of the flower, and conſiſts

of

of one piece that is divided into two lips; the lowermoſt of which is broad, wrinkled within, turned backwards, hangs down, and is of the length of the petals; the upper ſlender, like a line of elegant texture, and incorporated with the ſtyle. In vanelloe, it is ſhaped like a top, and placed at the back of the petals. Laſtly, in helleborine, it is placed in the middle of the flower, and in moſt of the ſpecies reſembles the embowelled body of a fly.

The FILAMENTS, or lower part of the ſtamina, are always two in number, very ſhort, and placed upon the *piſtillum*, or female organ; from which ſingular circumſtance, the plants in queſtion are arranged under the claſs *Gynandria* in the Sexual Method. *Vide* GYNANDRIA.

The ANTHERS or ſummits are erect, and generally covered by the upper lip of the *nectarium*.

The SEED-BUD is either oblong or pillar-ſhaped, twiſted like a ſcrew, and univerſally placed below the receptacle of the flower.

The STYLE is ſingle, very ſhort, and forms one ſubſtance with the inner margin of the *nectarium*, ſo that both ſtyle and ſtigma are with difficulty to be perceived. This laſt is commonly filled with a viſcous ſweet ſubſtance like honey.

The SEED-VESSEL is generally a capſule with one cavity and three valves or openings, which are commonly keel-ſhaped, and open on the angular ſides, being joined both at bottom and top. In vanelloe, the ſeed-veſſel is a long, cylindrical, unctuous, fleſhy pod. What chiefly diſtinguiſhes it from the capſular fruit of the other genera is, its wanting the keel-ſhaped ribs or valves, ſo conſpicuous in the other plants of this order.

The ſeeds are numerous, very ſmall like ſaw-duſt, and attached, without foot-ſtalks, to a ſlender receptacle, or rib, which extends itſelf length-wiſe in the middle of each incloſure. In vanelloe, they are almoſt round, ſhining, and of a black colour. In the other genera, they are rather flat, of a yellow colour, and fringed on the border with a longitudinal membrane, or wing.

The

The plants of this order are celebrated as mighty provocatives to venery. This reftorative quality, which is chiefly poffeffed by the roots, is moft predominant in the vanelloe of the Americans, the falep of the Eaftern countries, and the orchis and fatyrium of the Europeans. The tubercles of the roots have an acrid quality, which is deftroyed by drying, or moiftening them in warm water.

Vanelloes are the pods of a twining parafitic genus of plants, which grow plentifully on trees, both in the Eaft and Weft Indies. Thefe pods refemble our kidney beans, being about half a foot long, and containing a number of very fmall feeds. When ripe and dry, the inhabitants of Mexico and St. Domingo, whence thefe pods are imported into Europe in greateft abundance, gather them, and, having rubbed them with oil, left they fhould harden and break, form them into bundles, or bags of different fizes, containing, fome fifty, fome a hundred, fome a hundred and fifty pods. The Indians call the plant tlilxochitl, and the pod maxacochitl. Hernandez fays, it is ufeful in fuppreffions, warms and fortifies the ftomach, facilitates digeftion, and diffipates wind. Vanelloe has a very agreeable tafte and fmell. It is efteemed an excellent cordial, and enters into the compofition of chocolate, which, indeed, is its principal ufe with us. A black fragrant balfam is procured from the fame pods; but this is very rarely brought to Europe. The name vanilla, fignifying a fheath, was given to this plant by the Spaniards, from the figure of its pods.

The flowers of the different fpecies of orchis and *ophrys* are remarkably various and fingular in their fhape; refembling fometimes a naked boy, fometimes a gnat, a butterfly, a bee, a pigeon, an ape, a parrot, a lizard, or a fly. Thefe refemblances have given names to the fpecies in queftion. The beard or *nectarium* of the bee-flower, is a large fat leaf, beautifully reprefenting a drone or bee of a footy colour, and which, when turned to the light, feems variegated with three bright yellow circular lines, with ruft-coloured fpaces between them. The *nectarium* of humble-bee fatyrion,

rion, the *testiculus sphegodes hirsuto flore* of Ray, is remarkable for two upright lines, of a livid colour, and a transverse one of the same colour, representing a capital H. The flowers of many of the orchis-tribe are beautifully spotted.

ORDO, an order; the first subdivision of a class in the Sexual Method, corresponding to the term *sectio*, in Tournefort. Such a division, by parcelling out the genera of any class into several distinct lots, gives perspicuity to the method, and facility to its distinctions.

The orders in Tournefort's System are chiefly founded upon the fruit: those of the Sexual Method, on the number of styles or female organs. A particular enumeration of the latter is subjoined to their respective classes, whither the reader is referred for information on this subject.

I would at present, only remark one circumstance in which Linnæus's orders are preferable to those of Tournefort. The latter botanist expresses this subdivision by a circumlocution, which commonly includes a repetition of the abridged clavis of his System. On the other hand, Linnæus's orders are always expressed by a single term, which, like the names of the classes, is of Greek etymology, and is significative of the character of the order to which it is applied. It is needless to subjoin, that the names of these orders are often the same in different classes, because the same idea predominates in their institution. If the same character could, in like manner, be employed for distinguishing all the orders of each class, the system would, in that point, at least, have attained perfection. The classes in the Sexual System are much more uniform than the orders. The latter, therefore, as scientific divisions, are greatly inferior to the former.

ORDO, a term of Tournefort, corresponding to the *classis* or highest division of Linnæus. *Vide* CLASSIS.

ORGYA, a term of Measure. *Vide* MENSURA.

OVARIUM (*ovum*, an egg) the ovary; a name, by which botanists, who are fond of assimilating the animal and vegetable kingdoms, have distinguished the *germen* or seed-bud, as containing the rudiments of the future seed.

P.

PALATUM *corollæ*, the palate of the flower; by this name Linnæus characterizes any prominence or gibbosity in the jaws *(faux)* of the *corolla*.

PALEÆ, thin, membranaceous, chaffy plates springing out of a common receptacle, and intended as lines of partition between the small partial florets of compound and aggregate flowers.

PALEACEUS *flos*, a term of Ray, expressive of such flowers as produce no fruit. It corresponds to the *masculus flos* of Linnæus, the *sterilis* of Tournefort, the *abortiens* of other botanists.

PALMÆ, palms. Under this name Linnæus has arranged several genera, which, although capable of a place in separate classes of his system, he has chosen rather, on account of their singular structure, to place apart, in an appendix to the work.

The same plants constitute one of the seven families or tribes into which all vegetables are distributed by Linnæus in his *Philosophia Botanica*. They are defined to be plants with simple stems, which, at their summit, bear leaves resembling those of the ferns, being a composition of a leaf and a branch; and whose flowers and fruit are produced on that particular receptacle, or seat, called a *spadix*, protruded from a common calyx, in form of a sheath or scabbard, termed by Linnæus, *spatha*.

It is to be observed, however, that the terms *spatha* and *spadix*, though originally applied by Theophrastus to palms only, are used with much greater latitude by modern botanists, and applied to narcissus, snow-drop, orchis, satyrium, arum, dracontium, calla, pothos, sea-daffodil, and many other plants, whose flower-stalks come out of a sheath.

PALMÆ is likewise the name of the first order in Linnæus's Fragments of a Natural Method, consisting of the following genera, the three last of which, although not ranged with the palms in the appendix to his Artificial System, are placed

placed with them, on account of their alleged conformity in point of habit, in his Natural Method.

Linnæan Genera.			*English Names.*
α *Areca,*	—	—	The faufel-nut.
Boraffus,	—	—	Malabar-palm, called ampana and carim-pana.
Caryota,	—	—	Palm with doubly-winged leaves, called fchunda-pana.
Chamærops,	—	—	Leffer, or dwarf-palm, palmetto, thatch.
Cocos,	—	—	Cocoa nut tree.
Corypha,	—	—	Mountain-palm with largeft leaves, called codda-pana.
Cycas,	—	—	Todda-pana.
Elais.			
Elate,	—	—	Wild Malabar-palm, called Katou-Indel.
Phœnix,	—	—	Date-tree.
Zamia.			
β *Hydrocharis,*	—	—	Frog's-bit.
Stratiotes,	—	—	Water-foldier.
Vallifneria.			

Habit and Structure of the Plants of this Order.

The plants of this order are perennial, and moftly of the fhrub and tree kind. The ftem is in height, from two to a hundred feet and upwards.

The Roots form a mafs of fibres, which are commonly fimple, that is, without any ramifications. In frog's-bit, the roots are terminated by a fmall cup, of a conic form, which covers them like an extinguifher, as in duck's-meat.

The Stem is generally fimple, cylindrical, and compofed of ftrong longitudinal fibres.

The Leaves, which are a compofition of a leaf and a branch, termed by Linnæus *frondes*, are of different forms; being

being ſometimes ſhaped like an umbrella or fan; ſometimes ſingly or doubly-winged; the ſmall or partial leaves, which are often three feet in length, being ranged alternately. The branches or principal leaves are ſix, eight, ten and twelve feet long; the length varying according to the age and ſize of the plant.

They are covered at firſt with a brown thick duſt, like thoſe of the ferns. The baſe of the leaves frequently embraces the greater part of the ſtem. Schunda-pana is the only genus of this order yet known, which bears doubly-winged leaves.

The FLOWERS are male and female upon the ſame or different roots, except in water-ſoldier, which bears hermaphrodite flowers only, and palmetto, in which the flowers are hermaphrodite and male upon diſtinct roots. In *valliſneria* and frog's-bit too, the flowers are not ſo properly male and female upon different roots, as barren hermaphrodites; a ſmall ſeed-bud being diſcovered in thoſe called the male flowers, and the remains of ſtamina in the female. Abortive flowers of the ſame kind are frequently obſerved in *valliſneria* upon the ſame root.

The flowers are all diſpoſed in a panicle or diffuſed ſpike, except in the three laſt genera, in which they proceed ſingly from the angles of the leaves. In todda-pana, ſays M. Adanſon, the flowers grow upon the indentments of the leaves, whoſe diviſions form a kind of panicle.

The COMMON CALYX in this order is that ſort termed a *ſpatha* or ſheath, and has either one valve or opening, as in date tree, and cocoa-nut; or two, as in fauſel-nut, and wild Malabar-palm. The *ſpadix*, or head of flowers protruded from the ſheath, is generally branched. Each flower is commonly furniſhed with a *perianthium*, or proper flower-cup, conſiſting of three leaves or diviſions that are ſmall and permanent.

The PETALS are three in number, of a ſubſtance like leather, and permanent like the leaves of the calyx. The flowers of *zamia* have no petals.

The STAMINA are in number from two to twenty and upwards,

wards, and cohere ſlightly at the baſe. In frog's-bit they appear like a pillar in the centre of the flower.

The SEED-BUDS are from one to three in number, placed in the middle of the flower, and ſupport a like number of ſtyles, which are very ſhort. In frog's-bit, *vallifneria*, and water-ſoldier, the ſeed-bud is placed under the receptacle of the flower.

The SEED VESSEL is generally a pulpy fruit of the berry or cherry kind, containing one cell filled with fibrous fleſh, and covered with a ſkin, which is of a ſubſtance like leather.

The SEEDS are in number from one to three in each pulpy fruit, of a hard bony ſubſtance, round or oval, and attached by their baſe to the bottom of the fruit.

Theſe plants, particularly the ſeeds, are aſtringent, and of efficacy in dyſenteries.

The date-tree, the *phœnix dactylifera* of Linnæus, is a native of Africa, and the eaſtern countries, where it grows to fifty, ſixty, and one hundred feet high. The trunk is round, upright, and ſtudded with protuberances, which are the veſtiges of the decayed leaves. From the top iſſues forth a cluſter of leaves or branches, eight or nine feet long, extending all round like an umbrella, and bending a little towards the earth. The bottom part produces a number of ſtalks like thoſe of the middle, but ſeldom ſhooting ſo high as four or five feet. Theſe ſtalks, ſays Adanſon, diffuſe the tree very conſiderably; ſo that, wherever it naturally grows in foreſts, it is extremely difficult to open a paſſage through its prickly leaves. The flowers are male and female upon different roots. The dates, which are the produce of the female plant, grow in large ſpiral cluſters, each being about the bigneſs and ſhape of a middling olive, and containing within the pulp, which is of a yellow colour, and agreeable taſte, a round, ſtrong, hard nut or ſtone, of an aſh-colour, marked with a deep furrow running lengthwiſe. Of the freſh dates and ſugar, ſays Haſſelquiſt, the Egyptians make a conſerve, which has a very pleaſant taſte. The kernels or ſtones, though hard as horn, they grind on hand-

hand-mills, and in default of better food, give to their camels. Of the leaves are made baſkets, or bags, which are much uſed in Turkey on journies, and for other œconomical uſes. In Egypt they are uſed as fly-flaps, for driving away the numerous inſects, which prove ſo troubleſome in hot countries; and Rauwolff relates, that of the fibres of the leaves, and covering of the fruit, are ſpun ropes, of pretty large dimenſions and conſiderable ſtrength. The hard boughs are uſed for fences, and other purpoſes of huſbandry; the principal ſtem for building; in fine, no part of this curious tree wants its uſe. The fruit, before it is ripe, is ſomewhat aſtringent, but when thoroughly mature, is of the nature of the fig. The Senegal dates are ſhorter than thoſe of Egypt, but much thicker in the pulp, which is ſaid to have a ſugary agreeable taſte, ſuperior to that of the beſt dates of the Levant.

Palmetto, that is, little palm, called, by the Americans, thatch, from the uſe to which the leaves are applied, is a native of Africa and the Weſt-Indies, and ſeldom grows ſo high as the other palms. M. Adanſon, however, deſcribes, under the name of palmetto, a ſpecies of palm, which grows naturally at Senegal, whoſe trunk riſes from fifty to ſixty feet in height. The negroes call this palm, ronn, which name the French have changed to *rondier*. From the upper end of the trunk iſſues a bundle of leaves, which, in turning off, form a round head; each leaf repreſents a fan of five or ſix feet in expanſion, ſupported by a tail of the ſame length. Of theſe trees, ſome produce male flowers, which are conſequently barren; others are female, and loaded with fruit, which ſucceed each other uninterruptedly almoſt the whole year round. The fruit of the large palmettos, M. Adanſon affirms to be of the bigneſs of an ordinary melon, but rounder; it is enveloped in two ſkins as tough as leather, and thick as ſtrong parchment; within, the fruit is yellowiſh, and full of filaments, faſtened to three large kernels in the middle. The negroes are very fond of this fruit, which, when baked under the aſhes, is ſaid to taſte like a quince.

The

The fruit of the *areca*, or faufel nut, refembles a nutmeg in texture, and, when ripe, is infipid and aftringent. Its infpiffated juice is fuppofed to be the cachou, or, as it is improperly termed, Japan-earth of the fhops.

Palm-oil tree, or oily palm, is a native of Africa, and rifes about fifty feet high; from the fruit is drawn an oil, of which the negroes are remarkably fond. They generally roaft the fruit in the embers, and then fuck the fine fweet oil, which is contained in the many interftices of its yellow hufky tegument. With this oil they likewife anoint their bodies, to prevent a too plentiful perfpiration, as well as to fupple and relax their ftiffened nerves. Being thus anointed, their fkins appear fleek and fhining. Within the outward covering is the nut, which contains a white kernel, in tafte fomewhat refembling that of the cocoa-nut, but not fo agreeable. Thefe nuts, when bored and emptied of their kernels, are ftrung by the negroes, as ornaments about their necks. From the body of this and the cocoa-nut tree is extracted a liquor, which, when fermented, has an intoxicating quality, and is known by the name of palm wine.

The cocoa-nut tree is fuppofed to be a native of the Maldive Iflands, but is cultivated in both Indies, particularly in South America, and the Weft India Iflands, where it fupplies the inhabitants with many of the common neceffaries of life. This tree frequently rifes fixty feet high. The body of the trunk, which generally leans to one fide, occafioned, as is fuppofed, by the great weight of nuts which it fuftains when young, is the exact fhape of an apothecary's large iron peftle, being of an equal thicknefs at top and bottom, but fomewhat fmaller in the middle; its colour is of a pale brown throughout, and the bark fmooth. The leaves, or branches, often fifteen feet long, are about twenty-eight in number, winged, of a yellow colour, ftraight and tapering. The pinnæ, or partial leaves, are green, often three feet long next the trunk, but diminifhing in length toward the extremity of the branches. The branches are faftened at bottom by brown ftringy threads, about the fize of ordinary packthread, that grow out of them, and are interwoven like a web. The nuts hang at the top of the trunk, in clufters,

of

of a dozen each. Each nut, next the ſtem, has three holes cloſely ſtopped; one of them being wider and more eaſily penetrated than the reſt. When the kernel begins to grow, it incruſts the inſide of the nut in a bluiſh jelly-like ſubſtance. As this grows harder, the incloſed liquid, diſtilled into the nut from the roots, becomes ſomewhat acid; and the kernel itſelf, as the nut ripens, becomes ſtill more ſolid; and, at length, lines the whole inſide of the nut for above a quarter of an inch thick, being as white as ſnow, and of the flavour of an almond. The quantity of liquor in a full grown nut is frequently a pint and upwards. The huſky tegument of the nut conſiſts of ſtrong, tough, ſtringy filaments, which, when removed from the fruit, reſemble coarſe oakum; and might, perhaps, be conveniently enough uſed as ſuch. The ſhells of theſe nuts being tipped with ſilver, are frequently uſed for drinking-bowls; the bark of the tree may be wrought into cordage, and the leaves into baſkets, brooms, hammocks in form of nets, mats, ſacks, and other uſeful utenſils. The liquor contained in the ſhell is a moſt cooling wholeſome beverage in thoſe ſultry climates, and the white kernel a moſt agreeable food.

In the Eaſt Indies, during the prodigious rains and tempeſtuous ſeas on the coaſt of Malabar, which generally continue from the end of May till the beginning of September, the Banian Indians endeavour to appeaſe the incenſed ocean, by offering a number of gilded cocoa-nuts to its enraged waves; an anniverſary ceremony of which the young Indians are remarkably fond, as it gives them an opportunity of ſhewing their dexterity in ſwimming, to recover the nuts which have been thrown into the ſea. The cocoa-nut of the Maldive iſlands is eſteemed by the inhabitants a very powerful antidote againſt the bites of ſerpents, and other poiſons.

The cabbage-tree, or mountain palm, the *palma altiſſima non ſpinoſa* of Sloane, is a native of the Weſt Indies, where it is ſaid to riſe to the height of one hundred and fifty, and two hundred feet. It is, by ſome authors, called the palmetto royal; and well, ſays Hughes, in his Natural Hiſtory of

of Barbadoes, may it be called royal, ſince neither the tall cedars of Lebanon, nor any of the trees of the foreſt are equal to it in height, beauty, or proportion. It is generally as ſtraight as an arrow: near the earth it is about ſeven feet in circumference, but tapers as it aſcends. The bark is of an aſh colour till within twenty-five or thirty feet of the extremity of the tree, when it alters at once to a deep ſea-green, which continues to the top. Upon removing the large leaves or branches which ſurround the top of the trunk, a little way above the beginning of the green bark juſt mentioned, what is called the cabbage is diſcovered lying in many thin, ſnow-white, brittle flakes, in taſte reſembling an almond, but ſweeter. This ſubſtance, which cannot be procured without deſtroying the tree, is boiled, and eaten with mutton, by the inhabitants of the Weſt-Indies, in the ſame manner as turnips and cabbage are with us; it is likewiſe pickled, and ſent to Europe, where it is eſteemed an exquiſite delicacy.

In the pith of the trunk of the cabbage-palms, when felled, there breeds a kind of worms or grubs which are eaten, and eſteemed a great delicacy by the inhabitants of Martinico, and of the other French Weſt-India iſlands. Theſe worms, ſays Father Labat, are about two inches long, and of the thickneſs of one's finger; the head is black, and attached to the body without any diſtinction of neck. Their preparation for the table is as follows: they are ſtrung on wooden ſkewers before a fire, and, as ſoon as heated, are rubbed over with raſpings of cruſt, ſalt, pepper, and nutmeg; this powder abſorbs all the fat, which, during the cookery, would otherwiſe eſcape; when properly roaſted they are ſerved up with orange, or citron ſauce. Theſe worms being expoſed for ſome time to the ſun are ſaid to yield an oil which is of great efficacy in the piles. The oil in queſtion, ſays Labat, is never to be heated before its application to the part affected; as repeated experiments have evinced that its ſpirit is totally diſſipated by the fire.

From the pith of a ſpecies of palm that grows naturally in Japan, is prepared the ſubſtance, well known in the ſhops by

by the name of ſago. The pith is taken out, and, after being pounded in large mortars, is mixed with water. The liquor is then ſtrained, and the fæculæ formed into cakes, which the Japaneſe eat as bread, in default of rice: part of the ſame ſubſtance they granulate and dry, and ſend into Europe by the name of ſago; it is eſteemed highly nouriſhing and reſtorative.

From the dragon-tree, a palm which grows naturally in the Cape-Verd Iſlands, and has leaves like thoſe of the yucca or Adam's needle, flows by inciſion, a red gummy juice, commonly known by the name of dragon's blood, and reckoned vulnerary and aſtringent.

A ſpecies of water-ſoldier, or marſh-aloe, is the ſurpriſing plant which is ſaid to move in the waters of the Nile, ſeeking for nutrition in the ſame manner as animals. The fact is, that the plant produces tufts of leaves, at a very great diſtance from one another, and ſupported by a ſtem, which, after floating on the water, loſes itſelf inſenſibly in the earth, in much the ſame manner as the potamogetons, the menyanthes, and even the leaves of the water-lily.

PANICULA, (diminutive from *panus*—Feſtus; the woof wound on the quill in the ſhuttle) a mode of flowering, in which, according to Linnæus, the fructifications are diſperſed upon footſtalks variouſly ſubdivided. It is, in fact, a ſort of branching or diffuſed ſpike, compoſed of a number of ſmall ſpikes that are attached along a common footſtalk. The term is exemplified in oats, panic-graſs, and many other plants.

When the partial foot-ſtalks diverge, and the fructifications hang looſe, the panicle is properly ſaid to be diffuſe, (*panicula diffuſa*) as in *poa aquatica*, and *alpina*: when the foot-ſtalks approach, the panicle becomes ſtraight and narrow, (*panicula coarctata*) as in *feſtuca ovina* and *aira cærulea*.

PAPILIONACEUS *flos*, (*papilio*, a butterfly) a butterfly ſhaped flower. *Vide* COROLLA.

PAPILIONACEI, the name of two claſſes in Tournefort's and Pontedera's methods, conſiſting of herbs and trees with butterfly-ſhaped flowers. Theſe plants, which are the leguminoſæ

minofæ of Ray, and form a true natural aſſemblage, conſtitute the thirty-ſecond order in Linnæus's Fragments of a Natural Method under the ſame title, which indeed is expreſſive of their moſt ſtriking character.

Liſt of the Genera *contained in this Natural Order.*

SECTION I.

Butterfly-ſhaped Flowers, having the Filaments of the Stamina diſtinct.

Linnæan Genera.	English Names.
Anagyris, — —	Stinking bean trefoil.
Sophora.	

SECTION II.

Butterfly-ſhaped Flowers with One Set of united Filaments.

Abrus, — —	Wild liquorice.
Amorpha, — —	Baſtard Indigo.
Anthyllis, — —	Kidney-vetch, or ladies finger.
Arachis, — —	Earth or ground-nut.
Aſpalathus, — —	African broom.
Borbonia.	
Crotalaria, — —	Rattle-wort.
Ebenus, — —	Ebony of Crete.
Erythrina, — —	Coral tree.
Geniſta, — —	Single-ſeeded broom, Dyer's broom.
Lupinus, — —	Lupine.
Niſſolia.	
Ononis, — —	Anonis, or reſt-harrow.
Piſcidia, — —	Dog-wood tree.
Pterocarpus.	
Spartium, — —	Broom.
Ulex, — —	Furze, whins.

SECTION III.

Butterfly-ſhaped Flowers with two Sets of united Filaments.

Aeſchynomene,	— —	Baſtard-ſenſitive-plant.
Aſtragalus,	— —	Liquorice vetch, or milk vetch, goat's-thorn.
Biſerrula.		
Cicer,	— —	Chich pea.
Clitoria.		
Colutea,	— —	Bladder-ſenna.
Coronilla,	— —	Jointed-podded colutea.
Cytiſus,	— —	Laburnum, baſe tree-trefoil.
Dolichos.		
Ervum,	— —	Lentil.
Galega,	— —	Goat's-rue.
Geoffraea.		
Glycine,	— —	Carolina kidney-bean tree.
Glycyrrhiza,	— —	Liquorice.
Hedyſarum,	— —	French honey-ſuckle.
Hippocrepis,	— —	Horſe-ſhoe vetch.
Indigofera,	— —	Indigo.
Lathyrus,	— —	Chichling vetch, everlaſting pea.
Lotus,	— —	Bird's-foot trefoil.
Medicago,	— —	Medic, ſnail and moon-trefoil, Lucern.
Ornithopus,	— —	Bird's-foot.
Orobus,	— —	Bitter vetch.
Phaca,	— —	Baſtard milk-vetch.
Phaſeolus,	— —	Kidney-bean, or French-bean.
Piſum,	— —	Pea.
Pſoralea.		
Robinia,	— —	Falſe acacia.
Scorpiurus,	— —	Caterpillars.
Trifolium,	— —	Trefoil.
Trigonella,	— —	Fenugreek.
Vicia,	— —	Vetch, bean.

Habit and Structure of the Plants of this Order.

Thefe plants, otherwife called leguminous, from the feed-veffel, which is that fort termed a *legumen*, are very different both in fize and duration; fome of them being herbaceous, and thofe either annual or perennial; others, woody vegetables of the fhrub and tree kind, a few of which rife to the height of feventy feet, and upwards. The herbaceous plants of this order generally climb, for being weak, and, as it were, helplefs of themfelves, indulgent Nature has either provided them with tendrils, and even fharp-pointed hooks at their extremities, to faften upon the neighbouring trees or rocks, or endued the ftalks with a faculty of twifting themfelves, for the purpofe of fupport, around the bodies in their neighbourhood.

The pea, vetch, and kidney-bean, afford familiar examples of the appearances in queftion. The fhrubs and trees of this natural family are moftly armed with ftrong fpines.

The Roots are very long, and furnifhed with fibres: fome genera have flefhy tubercles, placed at proper intervals along the fibres.

The Stems are cylindric, as are likewife the young branches, which are placed alternately: thofe which climb twift themfelves from right to left, in a direction oppofite to the apparent diurnal motion of the fun.

The bark of the large trees is extremely thick, and wrinkled, fo as to refemble a net with long mefhes; the wood is very hard in the middle, and commonly coloured, or veined; the alburnum is lefs hard, and generally of a yellow colour.

The Buds are hemifpherical, without fcales, and proceed from the branches horizontally, a little above the angle which they form with the leaves.

The Leaves are alternate, and of different forms, being either fimple, finger-fhaped, or winged. This laft form is very common. The lobes or leffer leaves are entire, and fometimes placed in pairs, as in wild liquorice, vetch, lathyrus, and ground nut; but moft commonly, the winged-leaf

is

is terminated by an odd lobe; as in colutea, liquorice, goat's rue, fenugreek, ladies finger, medicago, aftragalus, indigo, and coronilla. The winged or pinnated leaves of this order have a daily or periodical motion depending upon the progrefs of the fun in his diurnal courfe. See the article Motus, where the motion alluded to is particularly explained.

The common foot-ftalk of the winged and other compound leaves is marked on the upper furface with a cavity, or furrow, which runs through its whole length. In the vetch, lathyrus, and fome others, the foot-ftalk is terminated by a pretty long branching tendril, inftead of the odd lobe, which in thefe plants is wanting; although, from the alternate difpofition of the leffer leaves along the foot-ftalk, an abrupt termination does not appear natural.

Aphaca, a fpecies of lathyrus, has no leaves; that want being fupplied by a fimple tendril, which proceeds at each joint from the ftem, betwixt two large *ftipulæ* that are oppofite, and united, fo as to form the appearance of a fingle leaf penetrated by the ftalk. The furface of the leaves of fome fpecies of pforalea is covered with pellucid glandular knobs, which, when held up to the light, appear like fo many minute points, or holes: the calyx is ftudded in like manner.

The Flowers are hermaphrodite, and proceed either from the wings of the leaves, as in furze, goat's-rue, liquorice, lupine, colutea, kidney-bean, goat's thorn, a fpecies of aftragalus, *biferrula*, medicago, and glycine; or from the extremity of the branches, as in ebony of Crete, falfe acacia, trefoil, lotus, African broom, *crotalaria*, and coral-tree. In a fpecies of goat's rue of Senegal, mentioned by M. Adanfon, the fpike of flowers proceeds not from the angle of the leaves, but from the oppofite fide of the branches, as in the rough-leaved plants.

The Calyx is a *perianthium* of one leaf, bell-fhaped, bunching out at the bottom, and cut on its brim or margin into five irregular divifions, or teeth, the lowermoft of which, being the odd one, is longer than the reft: the other four ftand in pairs, of which the uppermoft is fhorteft, and ftands

ſtands fartheſt aſunder. The bottom of the calyx is moiſtened with a ſweet liquor like honey, ſo may be deemed the *nectarium* of theſe plants.

Some ſpecies of kidney-bean have a ſecond calyx without the other, that is round, and conſiſts of two leaves.

The PETALS are four or five in number, very irregular, and from their figure and poſition, bear an obvious reſemblance, in moſt of the genera, to a butterfly expanding its wings for flight. Theſe petals have been characterized by diſtinct names: the upper one, which is commonly the largeſt, is termed the ſtandard, (*vexillum*); the two ſide petals, the wings, (*alæ*); and the lowermoſt, which is generally united at top, and divided at bottom, the keel, (*carina*). *Vide* COROLLA.

In baſtard indigo, the flower is furniſhed with the upper petal, or ſtandard, only; a circumſtance which eſſentially diſtinguiſhes the genus in queſtion. In kidney-bean, the keel, involving the parts of generation, is ſpirally twiſted, in a direction oppoſite to the ſun; by which character this genus is diſtinguiſhed from dolichos, to which it is otherwiſe very nearly allied. In Ethiopian bladder-ſenna, the ſtandard is ſhorter than the keel; the wings much ſhorter than the ſtandard. Some ſpecies of trefoil have only one petal, the ſtandard, wings, and keel, being conjoined. In fenugreek, the keel is very ſmall, and the ſtandard and wings are ſo ſituated, as to form the appearance of a regular flower with three petals; whence the name *trigonella*, that is, three-cornered flower, which has been given to this genus. Ebony of Crete has no wings to its flowers. In coral-tree, both wings and keel are very ſhort, ſo that the butterfly-ſhape is not very conſpicuous in the flowers.

The flowers fall off very early in moſt of theſe plants, except in the trefoils with one petal, and ſome ſpecies of ladies finger, in which they are permanent. That they may ſometimes, though very rarely, be rendered double by culture, ruſhy, or Spaniſh broom, the *ſpartium junceum* of Linnæus, is ſufficient evidence.

The STAMINA are generally ten in number. Theſe are

are either totally diftinct, as in plants of the firft fection, or united by the filaments into one or two bundles involving the feed-bud, as in thofe of the fecond and third. In the latter cafe, where there are two fets of united filaments, one of the fets is compofed of nine ftamina, which are united into a crooked cylinder that is cleft on one fide through its whole length. Along this cleft lies the tenth filament, or ftamen, which conftitutes the fecond fet, and is often fo clofely attached to the large bundle, that it cannot be feparated without fome difficulty.

Upon the union of the ftamina juft mentioned is founded the fyftematic or artificial character of the clafs *Diadelphia* in the Sexual Method: to which clafs, all the plants of this order, except thofe of the firft fection, are referred. Yet with what propriety can the plants of the fecond fection, which confeffedly have but one fet of united filaments, or, at leaft, whofe filaments are all connected at the bafe, be arranged under a clafs whofe characteriftic, as expreffed in the title, is to have two diftinct fets, or *brotherhoods*, (fo the term imports) of ftamina fo united? Their ftructure would much more naturally determine them to a place in the immediately preceding clafs, *Monadelphia*, which, indeed, is expreffive of the very circumftance in their ftructure alluded to. The plants even of the third fection, though they come nearer to the defcription expreffed in the title, are very rarely to be difcovered, or diftinguifhed by that circumftance. In fhort, the more accurately we examine the ftructure of the butterfly-fhaped flowers, the more reafon fhall we find to be diffatisfied with the arbitrary manner in which Linnæus has arranged them, and to prefer the more natural and eafy arrangements from the figure of the flower, and ftructure of the fruit.

The anthers are fmall, round, marked with four longitudinal furrows, and flightly attached to the filaments. In lupine, the *anthers* are alternately round and oblong.

The SEED-BUD is fingle, placed upon the receptacle of the flower, oblong, cylindrical, flightly compreffed, of the length of the cylinder of the united ftamina by which it is involved;

involved; and fometimes, as in coral-tree, elevated by a flender foot-ftalk, which iffues from the centre of the calyx.

The STYLE is fingle, flender, and generally crooked. In pea, the ftyle is hairy, three-cornered, and keel-fhaped above; by which laft circumftance chiefly, that genus is diftinguifhed from lathyrus, in which the ftyle is plain.

The STIGMA, or fummit of the ftyle, is generally covered with a beautiful down, and placed immediately under the *anthers*, or tops of the ftamina.

The SEED-VESSEL in this order, is that fort of pod, termed a *legumen*, which is of an oblong figure, more or lefs compreft, with two valves, and one, two, or more cavities; thefe cavities are often feparated, when ripe, by a fort of joints, which are confpicuous in the pods of coronilla, French honey-fuckle, horfe-fhoe vetch, bird's foot, baftard-fenfitive-plant, and fcorpiurus: in the latter, the pods rarely open of themfelves; but as they are more eafily feparated crofs-wife by the joints than length-wife by the futures, it would feem that they have been naturally deftined to fplit in that manner. In *pterocarpus* the pod is compreffed, of a leafy fubftance, marked with veins on the fides, and woody within; in lupine, and ground-nut, it is of a fubftance like leather; in ladies finger it is roundifh, and placed within the permanent calyx; in borbonia it is pointed, and terminated with a fpine; in furze, it is turgid, and almoft furrounded by the calyx; in anonis it is of the figure of a rhombus; in bladder-fenna it is large, inflated like a bladder, membranaceous, tranfparent, and opens at the bafe of the upper future; in *hippocrepis* it is fhaped like a horfe-fhoe; in *hedyfarum clypeatum* it is round like a fhield; in medic, or lucern, it refembles a fnail's fhell, or ram's horn.

The SEEDS are generally few in number, round, fmooth, and flefhy. Jointed pods have generally a fingle feed in each articulation. The feeds are all faftened along one future, and not alternately to both, as in the other fpecies of pod termed *filiqua*.

The plants of this family are, in general, mucilaginous.

From the inner bark of most of them flows, either naturally, or by incision, a clammy liquor, which dries and hardens like gum; the juice of some others, as liquorice, and glycine, is sweet like sugar.

Some of these plants are bitter to the taste, purgative, or emetic, and even mortal. A species of eastern astragalus with goat's rue leaves, is said to be remarkably caustic, and to burn the tongue excessively when chewed. In general, however, these plants are soft and clammy.

Common dyer's broom has the fœtid nauseous smell of the elder-tree.

With respect to their virtues, the plants of this order are highly emollient; some of them too are vulnerary and astringent; the root of anonis, or rest-harrow, is diuretic.

The leaves of these plants, particularly those of trefoil, lucern, vetch, lotus, lathyrus, French honey-suckle or saint-foin, and fenugreek, afford excellent pasture for cattle; the seeds, which are meally and flatulent, are used in food both for men, and quadrupeds of the tame kind. The chief of the esculent seeds are those of the pea, bean, vetch, kidney-bean, chich-pea, and lentil. Externally these plants are applied to inflammatory tumours which tend to suppuration. Dyer's broom is said to be of use in dropsies. From the young shoots of *amorpha*, and a species of *sophora*, the inhabitants of North America formerly prepared a coarse sort of Indigo, before the introduction of the true-Indigo plant; for which reason the title of bastard-Indigo is given to the former genus.

The branches of *genista tinctoria* are used by dyers to give a yellow colour, whence the scientific and English names of this species.

The seeds of white lupine are sometimes used in medicine; they are bitter and disagreeable to the taste, but open, resolve, and cleanse. An ointment made of the powder of the seeds, juice of lemons, and allum, is esteemed an excellent cosmetic.

Prickly anonis, or rest-harrow, overspreads the eastern countries, particularly Egypt and Palestine, in such abundance, that Dr. Hasselquist concludes it to be one of those pernicious

pernicious cumberſome plants, which are ſo frequently mentioned in Scripture by the name of thorns.

Purple reſt-harrow without thorns, the *ononis mitis* of Linnæus, which grows plentifully on the borders of fields and barren paſtures in England, emits a viſcid kind of moiſture that ſmells rank like a goat.

Dogwood-tree, the *piſcidia erythrina* of Linnæus, which grows plentifully in the Weſt-Indies, is chiefly noted for the quality ſaid to be poſſeſſed by its bark, of intoxicating fiſh, which, by that means, become an eaſy prey to thoſe who employ this ſtratagem againſt them. When any number of gentlemen have an inclination to divert themſelves with fiſhing, or more properly ſpeaking, with fiſh-hunting, they ſend each of them a negro ſlave to the woods, in order to fetch ſome of the bark of the dogwood-tree. This bark is next morning pounded very ſmall with ſtones, put into old ſacks, carried into rocky parts of the ſea, ſteeped till thoroughly ſoaked with ſalt-water, and then well ſqueezed by the negroes to expreſs the juice, which immediately colours the ſea with a reddiſh hue, and being of a poiſonous nature will, in an hour's time, make the fiſhes, ſuch as groopers, rock-fiſh, old wives, welchmen, &c. ſo intoxicated, as to ſwim on the ſurface of the water, quite heedleſs of the danger. The gentlemen then ſend in their negroes, who purſue, both ſwimming and diving, the poor inebriated fiſhes, till they catch them with their hands; their maſters, mean time, ſtanding by, on high rocks, to ſee the paſtime.

It is remarkable, that though this poiſon kills millions of the ſmall fry, it has never been known to impart any bad quality to the fiſh, which have been caught in conſequence of the intoxication.

The wood of this tree, although pretty hard, is only fit for fuel; and even for this purpoſe, the negroes very ſeldom, if ever, employ it, on account of its ſingular quality juſt mentioned. The bark is rough, brown, and thick; the tree ſends forth a conſiderable number of branches, and is well cloathed with leaves, which reſemble thoſe of the pea, are

are thick, cottony, and of a deep green. The bark ufed for the above-mentioned purpofe is chiefly that of the roots. See Labat, Voyage aux Ifles de l'Amerique; and Smith's Natural Hiftory of Nevis.

The branches or ftalks of common broom being dried in the fun, and treated like hemp, produce threads which may be fpun, and worked into a coarfe linen cloth. In the country they are made into befoms, thence denominated brooms; from this its familiar ufe, Linnæus has derived the trivial name of this fpecies, and called it *fpartium fcoparium*, fweeping-broom.

The wood of a Weft-Indian fpecies of broom, the *fpartium arborefcens* of Miller, frequently known by the name of American ebony, is of a fine greenifh-brown colour, hard, durable, and admits of an exceeding good polifh.

M. Adanfon, in his Voyage to Senegal, mentions a new fpecies of baftard-fenfitive-plant, which he had found growing wild in feveral parts of that country. This plant, by the negroes termed *billeur*, rifes to about ten feet in height; its roots are clofely twifted; the wood, which is lighter than cork, is much ufed by the negroes in fifhing, and for tranfporting them over rivers, which, by reafon of their breadth, render fwimming, without fuch a precaution, dangerous.

Goat's thorn, affirmed by Tournefort to be the plant which produces gum-dragant, or tragacanth, is the *aftragalus tragacantha* of Linnæus. It is a native of the Levant, and fome maritime parts of France, where it grows to the height of two or three feet. The branches are very woolly, and the foot-ftalks of the leaves end in long fharp thorns; the gum flows both fpontaneoufly, and by incifion, from the roots and trunk, and is generally of a light fubftance, white, fhining, and curled. It is efteemed highly refrefhing.

The leaves and feeds of common bladder-fenna have a purgative quality, on which account they are frequently fubftituted for fenna by the peafants of Languedoc, Provence, and Italy, where the plant naturally grows. The leaves have an acrid naufeous tafte.

The leaves of fcorpion fenna, the *coronilla emerus* of Linnæus,

næus, are likewife efteemed laxative, and employed by the European peafants for the fame purpofe as thofe of the plant above mentioned. A dye is procured, by fermentation, from the leaves, like that of Indigo.

The common laburnum, the *cytifus laburnum* of Linnæus, the *cytifus alpinus latifolius, flore racemofo pendulo*, of Ray and Tournefort, grows naturally on the Alps and the mountains of Dauphiny. It grows to the fize of a pretty large tree, with a ftraight ftem; the bark is of a greenifh colour; the wood very hard, and when finely polifhed bears a great refemblance to green ebony; whence the plant is generally known in France by the name of ebony of the Alps. It is frequently ufed on the continent, and in the highlands of Scotland, for making different kinds of houfehold furniture, as chairs, tables, and bedfteads, which are faid to equal the fineft manhogany in beauty.

A fpecies of *cytifus*, termed by Linnæus, *cytifus cajan*, is known in the Weft-Indies, where it naturally grows, by the name of pigeon-pea, from the feeds being the common food of thofe birds in that part of the world. The leaves are very foft, and covered with a white hoary meallinefs on the under furface. The flowers which grow in clufters, are of a yellow colour, and fucceeded by pods, containing three, four, or five roundifh feeds, or peas, feparated from one another by flender tranfverfe partitions. Thofe feeds, befides the ufe juft mentioned, are boiled and eaten, whether green or dry, and being of a binding quality, afford a very wholefome food, efpecially during the wet feafon, when dyfenteries are fo frequent. The wood of the fame plant is ufed for fuel.

The pods of *dolichos urens*, a twifting or climbing plant, are thickly covered with very fine fhort briftles, or ftiff hairs, which fting worfe than nettles; hence the title of cow-itch vine, by which this fcandent plant is generally known in the Weft-Indies. The leaves are downy and glifter on their under furface. The feeds are black, and furnifhed with an eye like thofe of the bean.

The roots of liquorice, the only part ufed in medicine, are

are pectoral, and of great use in distempers of the lungs, as coughs, catarrhs, shortness of breath, and hoarseness. Its chief place of growth with us is about Pontefract in Yorkshire, and Worksop in Nottinghamshire, where it is propagated for sale. Black liquorice is the inspissated juice of the root of the liquorice plants. The best preparation of this kind is that which is brought from Catalonia in Spain.

From the *hedysarum alhagi* of Linnæus, which grows plentifully in Syria and the eastern countries, flows abundantly a juice, which when condensed upon the plant, is gathered by the inhabitants, and sent to Europe by the name of Persian manna.

From the leaves and small branches of the *indigofera tinctoria* of Linnæus, is prepared that excellent dye, known by the name of indigo. The leaves, when ready for this purpose, are cut down, and thrown into large vats of water, where they are suffered to steep till a violent fermentation ensues, and the water acquiring heat, boils upon every side of the infused leaves, and insensibly becomes of a violet colour. When these effects, which generally happen after sixteen or eighteen hours infusion, are observed, the water is conveyed, by means of cocks at the bottom of the vat, into another vessel, of the nature of a churn, where it is worked, by a negro, with great violence, till the water abounds with a lather, and the salts, and other parts of the substance of the plant are sufficiently united. It is then allowed to settle, and the water, which becomes as clear as at first, is drawn off by means of cocks, leaving at the bottom of the vessel, a sediment or fæcula, like the lees of wine, which, when dried, is the valuable dye known by the name of indigo.

The negroes on the coast of Guinea gather the leaves of the indigo plant at any time of the year, and having pounded them in a mortar, make the paste up into loaves, which they preserve dry. When they want to make use of them in dying, they dissolve them in a kind of lee, made of the ashes of an unctuous plant which grows in their fields, the *portulaca marina latifolia* of Plumier, by the negroes called rheme.

This

This lee imbibes a tincture of the indigo, into which they dip their linen cold, as often as they think neceffary, according to the deepnefs of the colour required.

The roots of *lathyrus arvenfis repens tuberofus* of Bauhin are efteemed an excellent food by the Siberians. They are compofed of feveral fmall round bulbs, or knobs; whence the plant is termed by Dodonæus, *terræ glandes*, or earth-nuts. In Holland likewife they are fold in the markets, and ufed for food.

M. Adanfon, in his Voyage to Senegal, mentions a leguminous tree, termed farobier by the negroes, who are extremely fond of its pods. The wood is hard and weighty. The pod, or hufk, is like that of a French bean, but above a foot in length, and contains a black flat feed, enveloped in a yellow farinaceous fubftance, which frequently ferves them for fuftenance, efpecially on a journey. It is very nourifhing, fays Adanfon, and taftes like the beft ginger-bread cake.

Of the wood of the fhrubby medic, which is fuppofed to be the *cytifus* of Virgil, the Turks make handles to their fabres.

The knobs of the root of Englifh wild-wood, or bitter vetch, tafte very like liquorice, and are ufed in the highlands of Scotland for the fame diforders of the breaft, in which liquorice is proper. The fame knobs tempered with water are faid to be of fingular efficacy in enabling thofe who ufe it to fuftain hunger and thirft for a very confiderable time.

The leaves of common meadow trefoil are drying and binding, ufeful in fluxes, ftrangury and heat of urine. Made into a poultice with hog's-lard, they are reckoned good for tumours and inflammations.

The leaves and flowers of melilot, the *trifolium melilotus officinalis* of Linnæus are ufed in medicine. They foften, difcufs, and eafe pain, and are frequently ordered in cataplafms againft inflammations, hard tumours, and any kind of fwelling. Melilot plafter, made of the leaves of this herb boiled in mutton fuet, rofin, and wax, is drawing, and

and good for green wounds, but is chiefly uſed in dreſſing of bliſters.

PAPPOSÆ, (PAPPUS, *vide infra*) the name of the 11th claſs in Chriſtopher Knaut's Method, conſiſting of compound flowers which have their ſeeds crowned by a

PAPPUS, (thiſtle-down—*pappi volantes* Lucr. Pliny gives this name to the *ſenecio* or groundſel, another down-bearing plant. His words are, *Erigeron à noſtris vocatur Senecio, al. pappus*) ;—a ſort of feathery or hairy crown, with which many ſeeds, particularly thoſe of compound flowers, are furniſhed, for the purpoſe of diſſemination. A ſeed, ſurmounted by its *pappus*, reſembles a ſhuttle-cock ; ſo that it is naturally framed for flying, and for being tranſported by the wind to very conſiderable diſtances from its parent plant ;—an admirable contrivance of nature to diſſeminate her productions, and thus render common to different ſoils and territories, individuals of the ſame ſpecies, which, without ſuch precaution, might have been confined to one. It muſt be obſerved, however, that Dandelion, hawk-weed, nipple-wort, groundſel, and many others of our moſt cumberſome weeds, are diſſeminated in this manner.

The pappus, as was juſt hinted, is either ſimple like hairs, *(pappus piloſus)* as in ſilk cotton-tree, ſucculent ſwallow-wort, colt's-foot, groundſel, golden rod, hawk-weed, doronicum, cacalia, and ſeveral other compound flowers ; or branched like a feather, *(pappus plumoſus)* as in valerian, dandelion, ſonchus, hemp-agrimony, and cud-weed. In ſome plants, as hawk-weed, and prenanthes, the *pappus* adheres immediately to the ſeed ; in others, as lettuce, and crepis, it is elevated upon a foot-ſtalk which connects it with the ſeeds ; in the firſt caſe, it is termed by Linnæus, *pappus ſeſſilis* ; in the ſecond, *pappus ſtipitatus* ; the foot-ſtalk or thread upon which it is raiſed having obtained the name of *ſtipes*. *Vide* STIPES.

Linnæus has, with ſurprizing accuracy, pointed out the numerous varieties which obtain in this minute part of the plant, which he generally employs as a diſtinctive cha-racter

racter in discriminating the different genera of compound flowers. *Vide* SYNGENESIA.

PEDICELLUS (diminutive from *pediculus*, a foot-stalk) a partial flower-stalk; the proper stalk of any single flower in an aggregate or head of flowers. The principal stalk which supports all the flowers, is termed the common flower-stalk; the stalk of each partial flower, if it has one, is stiled the proper flower-stalk, and by Linnæus, *Pedicellus*.

PEDICULUS (diminutive from *pes*, a foot) a foot-stalk; a term used by the ancient botanists, to denote the foot-stalks both of flowers and leaves. Linnæus has exploded the term, and, in its place, substituted two others, *petiolus*, for the foot-stalk of the leaves; *pedunculus*, for the foot-stalk of the flowers.

PEDUNCULUS (*pes*, a foot) the foot-stalk of a flower, or head of flowers. Both flower and leaf-stalks were formerly ranged by Linnæus among the trunks: of late years, however, they have lost much of their consequence; and in the latest editions of the *Systema Naturæ*, are degraded to a place among the *fulcra*, or parts of plants that serve for support, protection, and defence.

The *Pedunculus*, or flower-stalk, elevates the flower and fruit only, without the leaves; the *petiolus*, or leaf-stalk supports the leaves only, without the flower, or fruit. Thus these partial trunks stand essentially distinguished from each other.

Flower-stalks have different epithets, from the place which they occupy on the plant. When they proceed immediately from the root, they are termed radical, *(pedunculus radicalis)* when from the stem, trunk-stalks, *(pedunculus caulinus)* when from the branch, branch-stalks, *(pedunculus rameus)* and so of others.

Again, flower-stalks sometimes terminate the stem or branches; sometimes proceed from the angle formed by the leaf and stem, or by the stem and branch. A flower-stalk of the former kind is termed by Linnæus *pedunculus terminalis*; of the latter, *pedunculus axillaris*, as it is from the

axilla,

axilla, or arm-pit of the leaf or branch, that the ſtalk in queſtion is protruded.

Flower-ſtalks, as well as flowers, are ſaid, in the language of botany, to be *ſolitary*, when they grow ſingly, or are produced one by one: *ſcattered* (*pedunculi ſparſi*) when they grow together in great numbers, and are produced without any order.

From the number of fructifications on each foot-ſtalk, ariſe other epithets of the *pedunculus*; ſome bear one, ſome two, ſome three flowers; others an indeterminate number; hence the terms *pedunculus uniflorus*, *biflorus*, *multiflorus*, &c. expreſſive of theſe ſeveral circumſtances. A ſolitary foot-ſtalk may ſupport many flowers; whilſt a ſolitary flower neceſſarily implies a ſingle or ſolitary flower-ſtalk.

For the different modes in which flowers are borne and connected on their foot-ſtalks, ſee the article INFLORESCENTIA.

The flower-ſtalks frequently afford excellent characters in diſcriminating the ſpecies. Thus a ſpecies of globe amaranth is very accurately diſtinguiſhed by its flower-ſtalks being furniſhed with two leaves that are placed oppoſite, and immediately under each head of flowers.

Flower-ſtalks, whether of equal or unequal length, that form an even ſurface at top, are termed by Linnæus *pedunculi faſtigiati*. The term is exemplified in ſweet-william, and viſcous campion.

A flower-ſtalk is termed flaccid, (*pedunculus flaccidus*) which is ſo weak and feeble, as to hang down by the weight of the flower which it ſupports.

A drooping or nodding flower-ſtalk (*pedunculus cernuus*) is bent at the top, ſo that the flower is inclined to one ſide, or towards the earth, and cannot be placed erect, on account of the curvature of the ſtalk. This term is exemplified in *carpeſium*, drooping-thiſtle, mountain-ſcabious, annual ſun-flower, and the Siberian ſpecies of bleſſed thiſtle.

In ſweet-weed and *oldenlandia biflora*, the flower-ſtalks come out in pairs; in a ſpecies of balſam, they proceed by threes from the angle of the leaves.

In

In *jambolifera*, *ochna* and justicia, the flower-stalks remain on the plant after the flower and fruit are fallen.

The flower-stalks of *aira flexuosa* take a variety of different directions; those of goat's-beard, *cotula*, and most of the nodding flowers, thicken towards the upper extremity.

In some species of Syrian mallow, *sida*, and wood-sorrel, the flower-stalks are jointed (*pedunculus articulatus seu geniculatus.*) These circumstances respecting the flower-stalks, will be found to be of singular use in discriminating the species.

PELTA, a very short buckler, or target;—by this name Linnæus characterizes the flower or flat fructification of the genus Lichen or liver wort, which, in most of its species, is glued to the edges of the leaves.

PENTAFORA (πεντε, five; and *fores*, a door) the name of a class in Camellus's Method, consisting of plants with seed-vessels which have five external openings or valves. It is exemplified in flax, lime-tree, Syrian mallow, and silk-cotton tree.

PENTANDRIA (πεντε, five; and ανηρ, a man or husband) the name of the fifth class in Linnæus's Sexual Method, consisting of plants which have hermaphrodite flowers with five stamina or male organs.

The orders in this numerous class of plants are six; and, like those of the other plain or numeral classes, are founded upon the number of styles, or female organs.

Night-shade, water-leaf, loose-strife, marvel of Peru, sow-bread, ivy, vine, and the rough-leaved plants, have one style.

Elm, dog's-bane, swallow-wort, gentian, and the umbelliferous plants have two styles.—Sumach, viburnum, tamarisk, bladder-nut, and chickweed, have three styles.

Grass of Parnassus and evolvulus have four styles.

Berry-bearing angelica, flax and thrift, have five styles.

Mouse-tail has many styles.

PENTANGIÆ (πεντε, five; and αγγος, a vessel) the name of the sixteenth class in Boerhaave's Method, consisting of plants with five capsules, or a single seed-vessel divided

ed internally into five cells. It is exemplified in rue, bean-caper, kalmia, ledum, dwarf roſe-bay, ſtrawberry-tree, winter-green, and columbine.

PENTAPETALI (πεντε, five; and πεταλον, a petal or flower-leaf) the name of two claſſes in Rivinus's Method; conſiſting of plants whoſe flowers have five petals, which, in their form, are either regular or irregular. The regular flower of five petals is exemplified in flax, berry-bearing angelica, rock-roſe, pæony, mallow, marſh-mallow, and ranunculus; the irregular, in aconite, and lark-ſpur.

PERFECTUS *flos*, a perfect flower; a term of Ray, Rivinus, Kramer, and Pontedera, correſponding to the *petalodes* of Tournefort, and expreſſive of the preſence of the petals, which, by thoſe authors, were deemed the eſſential part of every flower. In the Sexual Method, the petals are conſidered only as the inner cover of the flower, which is ſolely conſtituted by the preſence of the ſtamina and ſtigma, the ſuppoſed male and female organs of generation.

PERFORATÆ (*perforari*, to be pierced through) the name of an order in the former editions of Linnæus's Fragments of a Natural Method, conſiſting of plants, whoſe leaves have many pellucid ſpots in them, which, when held up againſt the light, appear like ſo many minute dots or points.

The genera in this order were four, St. John's-wort, *aſcyrum*, rock-roſe, and true orpine (telephium). The three former are now removed to the order *Rotaceæ*, the latter to *Miſcellaneæ*.

PERIANTHIUM (περι, around, and ανθος, the flower) the flower-cup properly ſo called; the moſt common ſpecies of calyx, placed immediately under the flower, which is contained in it as in a cup.

The flower-cup, like the other parts of fructification, differs in point of number, figure, proportion, and ſituation.

Vaillant eſtabliſhed for an axiom that in complete flowers, when the calyx is of ſeveral pieces, the flower, or corolla, is likewiſe of ſeveral pieces, *& è contra*. That this rule is

 erroneous,

erroneous, appears from the pea-bloom flowers, and thofe of the mallow tribe, in which the calyx confifts of one leaf, and the petals are five in number. On the other hand, it may be affirmed with certainty, that when the flower confifts of one petal, the calyx always confifts of one leaf, although the divifions may be fo deep as to induce an opinion, upon a fuperficial view, that it is compofed of feveral diftinct leaves. Thus in the rough leaved plants, the lipped and mafqued flowers, and fome other natural families, the calyx, although deeply divided, is determined to be of one piece, as the divifions, when the calyx is detached from the flower, adhere clofely together, and do not refolve themfelves into diftinct leaves, as they doubtlefs would, if divided to the bafe.

The number of fegments in a flower-cup of one piece is generally equal to the number of petals, if the flower confifts of more petals than one; or to the number of divifions of the fingle petal, if the flower contains no more. It may here be proper to obferve that a flower-cup confifting of many leaves is rarely found to have its leaves cut into fegments; the above rule therefore refpects only fuch flower-cups as have one leaf.

Some flowers, as tulip, crown imperial, and moft of the other liliaceous plants, want the flower-cup. In moft plants it is fingle. In morina, fide-faddle flower, and fome genera of the mallow tribe, double. *Vide* COLUMNIFERÆ.

With refpect to the number of leaves of which it is compofed, the flower-cup is either of one leaf (perianthium monophyllum) as in primrofe and thorn-apple; of two leaves, as in poppy, globe-amaranth, cock's-comb, hypecoum, claytonia, and fumatory; of three, as in dock, arrowheaded-grafs, tulip-tree, magnolia, cuftard-apple, and Virginian fpider-wort; of four, as in French willow, heath, water-lily, barren-wort, and the crofs-fhaped flowers, the *tetradynamia* of Linnæus; of five, as in ranunculus, rock-rofe, adonis, *jacquinia*, mountain knot-grafs, wild orach, golden-rod tree, glafs-wort, beet, moufe-tail, flax, and the greater number of flowers with more petals than one; of

 fix,

ſix, as in lion's-leaf, berberry, *hillia*, *flagellaria* and *tetracera*: of ſeven, as in winter-green, (*trientalis*) of eight, as in *mimuſops* and *diapenſia*; or of ten, as in galax.

A flower-cup of one leaf is either undivided, (perianthium integrum) as in genipa and olax; cut into two ſegments (perianthium bifidum) as in tuberous moſchatel, purſlane, and mammee; into three, as in *burmannia* and cliffortia; into four, as in ladies bed-ſtraw, and elephant's head; into five, as in tobacco, and the greater number of flowers that have a calyx of one leaf; into ſix, as in *ginora*; into eight, as in tormentil; into ten, as in cinquefoil, and herb-bennet; or into twelve, as in purple looſe-ſtriſe and water-purſlane.

With reſpect to figure, it may be obſerved, in general, that the calyx ſpreads leſs than the petals; an erect poſition being more ſuitable to its office, which is to prop and contain the flower. In cucubalus, the flower-cup is round like a globe; in viſcous campion it is club-ſhaped; in ſwallow-wort, it is turned backwards.

The leaves or diviſions of the flower-cup are either equal, as in moſt plants; or unequal, as in rock-roſe, tormentil and cinquefoil; in the two laſt of which examples, all the diviſions of the flower-cup are alternately greater and leſs; in rock-roſe, two of the five leaves of which the calyx conſiſts, are alternately leſs than the other three.

The margin of the cup in moſt plants is entire; in a ſpecies of St. John's wort it is ſawed, or indented (perianthium ſerratum); and in ſome ſpecies of centaury it is fringed like an eye-laſh (perianthium ciliatum).

The apex or tip of the flower-cup is ſometimes ſharp, as in primroſe and henbane; or blunt, as in water-lily and mangoſtan. In vervain the calyx is cut into five indentments, four of which are ſharp, and the fifth, being blunt, looks as if lopped or bit off.

With reſpect to proportion, the calyx is either ſhorter than the corolla, as in moſt plants; equal to it in length, as in a ſpecies of ceraſtium; or longer, as in *ſagina agroſtemma*, and a ſpecies of calve's ſnout.

 When

When the flower-cup includes the ſtamina and not the ſeed-bud, as happens in French-willow, and all the other flowers which have their ſeed-bud placed below the receptacle of the flower, it is termed the perianthium of the flower; when the ſeed-bud and not the ſtamina, the perianthium of the fruit; when both ſtamina and ſeed-bud, the perianthium of the fructification. *Linnæa*, clove-tree, and *morina*, have two *perianthiums*, which ſerve very properly to illuſtrate the terms juſt mentioned; one of theſe cups is appropriated to the flower, the other to the fruit. The perianthium of the fructification is exemplified in pæony, and the greater number of plants.

With reſpect to compoſition, the flower-cup ſometimes conſiſts of a number of leaves which are laid over one another like tiles or ſcales, (perianthium imbricatum) as in hawk-weed, ſow-thiſtle, and camellia; ſometimes of ſcales that ſpread wide, and are diffuſed on all ſides, (perianthium ſquarroſum) as in thiſtle, and flea-bane, in which the ſcales are not cloſely laid upon one another, as in hawk-weed, but diverge on every ſide. In pink, tick-ſeeded ſun-flower, water hemp-agrimony and baſtard hawk-weed, the baſe of the flower-cup, which is ſimple, is ſurrounded externally by a ſeries of diſtinct leaves, ſhorter than its own. This ſort of flower-cup Linnæus terms *calyx auctus*, an increaſed or augmented calyx; Vaillant had termed it, with equal propriety, *calyx calyculatus*; that is, a flower-cup furniſhed with a leſſer flower-cup.

With reſpect to duration, the flower-cup either falls off at the firſt opening of the flower, (perianthium caducum) as in poppy and barren-wort; with the flower, that is, the the petals, ſtamina, and ſtyle, (perianthium deciduum) as in berberry, and the croſs-ſhaped flowers; or continues till the fruit has attained maturity (perianthium perſiſtens) as in the lipped and maſqued flowers, and ſeveral others.

Laſtly, a flower-cup is proper to one flower, as in all the plants with ſimple flowers; or common to many, as in ſcabious and the compound flowers.

PERICARPIUM (περι, round; and καρπος, fruit) the ſeed-

feed-veffel; an entrail of the plant, big with feeds, which it difcharges when ripe. The feed-veffel is, in fact, the developed feed-bud, and may very properly be compared to the fecundated ovary in animals; for it does not exift till after the fertilizing of the feeds by the male duft, and the confequent fall of the flower. All plants, however, are not furnifhed with a feed-veffel; in fuch as are deprived of it, the receptacle or calyx performs its functions, by inclofing the feeds as in a matrix, and accompanying them to perfect maturity. This is particularly the cafe with the rough-leaved plants, and thofe of the firft order of the clafs *Didynamia* of Linnæus. *Vide* ASPERIFOLIÆ, *et* VERTICILLATÆ.

The different fpecies of *pericarpium* enumerated by Linnæus are as follows:

I. Capfula.
II. Siliqua.
III. Legumen.
IV. Folliculus, — Formerly *conceptaculum*.
V. Drupa.
VI. Pomum, — — *Fructus carnofus* of others.
VII. Bacca.
VIII. Strobilus, — — *Conus* of Tournefort.

Each of thefe terms is explained in its proper place.

Although the feed-veffel, like the other parts of fructification, is commonly employed to difcriminate the genera only; yet fuch ftriking circumftances in its ftructure as, for want of uniformity, cannot enter into the generic difference, are frequently ufed, with elegance, to diftinguifh the fpecies. Thus the inflated pod of *fumaria vefïcaria*; the top-fhaped fruit of the pear; the twifted feed-veffel of a fpecies of meadow-rue, fome fpecies of fcrew-tree and meadow-fweet; the prickly fruit of caltrops, and fuch like characters, which do not run through a whole genus, afford very certain marks of diftinction in determining the fpecies, and ought to be employed without referve.

PERSISTENS (*persisto*, to continue)—Permanent. This term is expressive of the third and longest stage of duration in plants, and, like the other terms of duration (*caducus* and *deciduus*) admits of different significations, according to the part of the plant to which it is applied. Leaves are said to be permanent which remain till the fruit is ripe. Stipules are permanent which continue on the plant after the fall of the other leaves; and this epithet is applied to such perianths, or flower-cups, as inclose the naked seeds, and, supplying the place of a *pericarpium*, accompany them to maturity. This last is the most common use of the term in Botanical language, and it is exemplified in the *asperifoliæ*, or rough-leaved plants of Ray, and in those of the order *gymnospermia* of the class *didynamia* of Linnæus. *Vide* CADUCUS *et* DECIDUUS.

PERSONATUS *flos*, (*persona*, a masque) a masqued flower; a flower with an irregular petal, resembling the head or snout of an animal. *Vide* RINGENS *flos*.

The masqued flowers constitute part of a class in Tournefort's Method, by the name of *flores tubulati, personati*, which partly correspond to the *didynamia angiospermia* of the Sexual Method.

PERSONATÆ, the name of the fortieth order in Linnæus's Fragments of a Natural Method, consisting of a number of plants, whose flowers are furnished with an irregular gaping or grinning petal, which, in figure, somewhat resembles the snout of an animal.

Most of the genera of this natural order arrange themselves under the class and order *didynamia angiospermia* of the Sexual Method. The rest, although they cannot enter into the artificial class just mentioned, for want of the classic character, (the inequality of the stamina,) yet, in a natural method, which admits of greater latitude, may be arranged with the *Personatæ*, which they resemble in their habit and general appearance, and particularly in the circumstance expressed in the title.

List of the Genera *contained in this Natural Order.*

SECTION I.

Plants with masqued Flowers having their Stamina of an equal length.

Linnæan Genera.			*English Names.*
Collinsonia.			
Dianthera.			
Gratiola,	—	—	Hedge-hyssop.
Justicia,	—	—	Malabar-nut.
Scoparia.			
Verbena,	—	—	Vervain.
Veronica,	—	—	Speedwell.

SECTION II.

Plants with masqued Flowers having two long and two short Stamina.

Acanthus,	—	—	Bear's breech.
Antirrhinum,	—	—	Calve's-snout, toad's-flax, snap-dragon.
Avicennia.			
Barleria.			
Bartsia.			
Besleria.			
Bignonia,	—	—	Trumpet-flower.
Bontia.			
Buchnera.			
Capraria,	—	—	Sweet-weed.
Chelone.			
Citharexylon,	—	—	Fiddle-wood.
Clerodendrum.			
Columnea.			
Cornutia.			

Craniolaria.

Linnæan Genera.			English Names.
Craniolaria.			
Cymbaria.			
Dodartia.			
Duranta.			
Erinus.			
Euphrasia,	—	—	Eye-bright.
Gerardia.			
Gesneria.			
Gmelina.			
Halleria,	—	—	African fly—honey-suckle.
Lantana,	—	—	American Viburnum.
Lathræa.			
Manulea.			
Martynia.			
Melampyrum,	—	—	Cow-wheat.
Mimulus,	—	—	Monkey-flower.
Obolaria.			
Orobanche,	—	—	Broom-rape.
Ovieda.			
Pedicularis,	—	—	Rattle-coxcomb, or louse-wort.
Petrea.			
Phryma.			
Rhinanthus,	—	—	Elephant's-head.
Ruellia.			
Schwalbea.			
Scrophularia,	—	—	Fig-wort.
Stemodia.			
Torenia.			
Tozzia.			
Vandellia.			
Vitex,	—	—	Agnus castus, or chaste-tree.
Volkameria.			

Habit and Structure of the Plants of this Order.

This order furnishes both herbaceous and woody vegetables of the shrub and tree kind.

The

The ROOTS are generably fibrous and branched; in gerardia and tozzia, they are tuberous. The roots of broom-rape are parafitical; that is, attach themfelves to the roots of other plants, from which they derive their nourifhment.

The STEMS and branches are cylindrical when young, except in fome fpecies of fig-wort, in which they are fquare.

The LEAVES are fimple, generally placed oppofite in pairs at the bottom of the branches, but in many genera, ftand alternate towards the top. In *lathræa*, *cymbaria*, and *ftemodia*, the leaves are placed alternate from the bottom to the fummit of the branches. The leaves of petrea are fo rough, that they ferve to file and polifh wood; thofe of broom-rape and lathræa refemble fcales. In hedge-hyffop and *limofella*, the leaves are tranfparent, and feem marked with dots or minute points. In halleria, they have feveral fmall prominences or knots on the under furface. In a fpecies of volkameria, after the fall of the leaves, the lower part of the foot-ftalk remains attached to the branches under the form of a thorn. The fame appearance is obferved in the genus *Tournefortia*. *Vide* ASPERIFOLIÆ.

Some fpecies of trumpet-flower have the common foot-ftalk of their winged leaves terminated by a tendril, with three or five branches. In a fpecies of cornutia is obferved a *ftipula* or fcale, in form of a half-moon, of the fame fubftance with the leaves, between which it is placed.

The FLOWERS are univerfally hermaphrodite. They proceed either fingly, or in clufters, from the wings of the leaves, as in American viburnum, bontia, columnea, hedge-hyffop, and fig-wort; or terminate the branches in a fpike, panicle, or head, as in cornutia, clerodendrum, gmelina, vervain, and agnus caftus. In the latter they feem placed in whirls.

The CALYX or flower-cup is of one leaf, which is cut into two, three, four, or five divifions that are permanent. In trumpet-flower the calyx falls off early, and generally refolves itfelf into five diftinct leaves. The flower-cup of bartfia is of a beautiful-red colour at its apex, by which

ftriking character the genus in queftion is chiefly diftinguifhed from eye-bright, elephant's-head, and rattle coxcomb, to which it otherwife feems nearly allied. The genus *cymbaria* ftands diftinguifhed from the other genera by the numerous divifions of the calyx.

The COROLLA is compofed of one irregular petal with two lips, refembling, as was already obferved, the head or fnout of an animal. In toad-flax, the petal is terminated behind by a nectarium in form of a fpur.

The STAMINA in plants of the firft fection, are two or four in number, and of an equal length; in thofe of the fecond, they are univerfally four in number, two of which are longer than the other two. In hedge-hyffop, and fome fpecies of vervain, the filaments are four in number, but two of thefe only are terminated by anthers; fo that the number of perfect ftamina in thefe plants is only two; the other two being, in the language of Linnæus, caftrated. The filaments likewife of vervain are generally of an unequal length. In *dianthera*, as the name obfcurely imports, two anthers are placed upon each filament; and in *chelone*, the rudiment of a fifth filament, without the anther, is placed within the upper pair of ftamina.

The SEED-BUD is fingle and placed above the receptacle of the flower. The ftyle is fingle, thread-fhaped, bent in the direction of the ftamina, and crowned with a *ftigma*, which is generally blunt, and fometimes divided into two. In American viburnum, the fummit of the ftyle is hooked; in which circumftance confifts the effential character of the genus. In broom rape, and *lathræa*, a glandular nectarium is feated at the bafe of the feed-bud.

The SEED-VESSEL is a capfule, generally divided internally into two cavities, and externally into the fame number of valves. In *lathræa*, *dianthera*, *jufticia*, *barleria*, *ruellia*, and bear's-breech, the capfule opens with an elaftic fpring.

The SEEDS are numerous, and affixed to a receptacle in the middle of the capfule.

Thefe plants poffefs nearly the fame qualities with the lipped-flowers, though in a lefs degree.

The

The powder of the roots and leaves of officinal vervain, or an infuſion of them in water, is applied with ſucceſs, both internally and externally, in dangerous ulcers, and tumours of the viſcera, particularly thoſe of the ſpleen. Both root and leaves have a bitter and diſagreeable taſte. The plant is generally found in the neighbourhood of dwelling-houſes.

The juice of a ſpecies of vervain with blue flowers, which grows naturally in the Weſt-Indies, is ſaid to be ſo powerful a deobſtruent, that a large ſpoonful taken inwardly, for three or four mornings in ſucceſſion, has greater efficacy in bringing down the catamenia, than either the uſe of chalybeate medicines, or any other method.

Fluellin, male ſpeed-well, or officinal veronica, is reckoned among the vulnerary plants, and uſed both inwardly and outwardly. It is likewiſe pectoral. The fumes of a decoction of this plant in water and vinegar being received into the mouth, by means of a funnel, are ſaid to be a ſovereign remedy in ſuffocations, and aſthmas, occaſioned by a collection of phlegm in the lungs. The herb is uſed as tea in gouty and rheumatic diſorders. The leaves have a ſomewhat bitter taſte, with little or no ſmell.

Brook-lime, the *veronica beccabunga* of Linnæus, is uſed in infuſion for the ſcurvy, and is a principal ingredient in moſt diet-drinks for that diſtemper. The herb is almoſt inſipid to the taſte, and without ſmell.

Round leaved female fluellin, the *antirrhinum ſpurium* of Linnæus, is ſucceſsfully uſed in fluxions and inflammations of the eyes.

Toad-flax, the *linaria vulgaris* of former botaniſts, the *antirrhinum linaria* of Linnæus, is rarely uſed internally; externally it is of efficacy in the piles. The diſtilled water of the herb is ſaid to be an excellent coſmetic.

Eye-bright has been long eſteemed a ſpecific in diſorders of the eyes, eſpecially for dimneſs of ſight, as the name ſeems to import. Its internal uſe, and even the propriety of its external application, has been of late greatly diſputed.

The berries of ſeveral ſpecies of camara, or American viburnum,

virburnum, which grow naturally in the Weſt-India iſlands, and are known by the name of wild ſage, ſerve for food to ſparrows and other birds. The leaves, either boiled into a decoction, or infuſed like tea, are an excellent ſudorific.

The roots of fig-wort powdered, and made into a plaſter with wax and ſoap, are ſaid to diſſipate cold ſcrophulous tumours in the neck. A decoction of the leaves cures the itch.

The leaves of water-betony, the *ſcrophularia aquatica* of Linnæus, are ſometimes uſed in the form of ſnuff, to promote ſneezing.

Collinſonia, a native of Penſylvania, and other parts of North America, from which it was introduced into Europe by the ingenious Mr. Bartram, is poſſeſſed of a peculiar ſcent, which, though agreeable, is ſo very ſtrong, as frequently to give a violent head-ach, eſpecially when the plant is abundant, and in flower. An infuſion of *Collinſonia* in water, taken internally, has been found efficacious in diſpelling the poiſon occaſioned by the bite of the rattle-ſnake; nor is the outward application of the herb leſs ſucceſsful in pains of the limbs, when the parts affected are rubbed with it. In New-York they diſtinguiſh this plant by the name of horſe-weed, becauſe the horſes eat it in ſpring, before any other herbs make their appearance.

PETALUM, (πεταλον, a leaf); a petal or coloured leaf of the flower. *Vide* COROLLA.

PETIOLUS, (diminutive *a pede, quaſi pediolus.*—By *Columella* it is uſed for the fruit-ſtalk—"*Petioli quibus pendent mala,*")—the foot-ſtalk of the leaves; one of the *fulcra* of plants, according to Linnæus, or parts that ſerve for ſupport, protection and defence. As the leaves and fructification are generally ſupported by different foot-ſtalks, Linnæus has very properly marked this diſtinction, by aſſigning to each foot-ſtalk a different name; *pedunculus* to that of the flower; *petiolus* to that of the leaves. In a very few inſtances, however, as turnera and Syrian mallow, the ſame foot-ſtalk ſupports both flower and leaves.

The foot-ſtalk of the leaves is of a green colour, ſometimes

times cylindrical, but moſt commonly furniſhed with two diſtinct ſurfaces, a front, and a back; the former flat, the latter round and convex. By this configuration, the footſtalks of compound leaves are generally with accuracy diſtinguiſhed from the young branches, with which beginners are very apt to confound them. *Vide* FOLIUM.

This part of the plant ſometimes affords very elegant marks of diſtinction in diſcriminating the ſpecies. Thus the winged footſtalks of the orange-tree, and *hedyſarum triquetrum*, ſufficiently diſtinguiſh each from its reſpective congeners.

PILEUS, a hat or bonnet; the orbicular horizontal expanſion or upper part of a muſhroom, which covers the fructification. This, from its figure, is properly enough termed by botaniſts the hat of the muſhroom.

PILI, hairs; one of the ſpecies of *pubes* or defenſive weapons with which ſeveral plants are furniſhed. *Vide* PUBES.

PIPERITÆ (*piper*, pepper) the name of the ſecond order in Linnæus's Fragments of a Natural Method, conſiſting of pepper, and a few genera which agree with it in habit, ſtructure, and ſenſible qualities, particularly the latter.

Liſt of the Genera *contained in this Order.*

	Linnæan Genera.		English Names.
α	*Ambroſinia.*		
	Arum,	— —	Cuckow-pint, or wake-robin.
	Calla,	— —	African arum.
	Dracontium,	— —	Dragons.
	Pothos.		
	Zoſtera,	— —	Graſs-wrack.
β	*Acorus,*	— —	Sweet-ruſh, or calamus aromaticus.
	Orontium,	— —	Floating arum.
	Piper,	— —	Pepper.
	Saururus,	— —	Lizard's-tail.

Theſe plants are moſtly herbaceous and perennial. The

ſtalks

ſtalks of *pothos* creep along rocks and trees, into which they ſtrike root at certain diſtances. The greateſt height to which any of theſe plants is known to attain, is fifteen feet; the greater part do not exceed three or four.

The fleſhy roots of many of theſe plants, particularly thoſe of ſeveral ſpecies of arum, are extremely acrid when freſh. They loſe this pungent quality, however, by being dried, and become of a ſoapy nature. The ſmell of many of the arums, and of ſome other plants of this order, particularly *Dracontium fœtidum*, is very offenſive, frequently reſembling the odour of human excrements. The flowers, however, of an Ethiopian ſpecies of *dracunculus*, or arum, the *Calla Æthiopica* of Linnæus, and the cover in which they are involved, are ſaid to emit a very fragrant odour.

With reſpect to their virtues, theſe plants are aſtringent. The fæcula of common arum poſſeſſes the diaphoretic virtue of antimony; the powder of its root attenuates and diſſipates obſtructions.

In hot countries, the tuberous roots of many of the arums, particularly thoſe of the ſpecies called colocaſia, are dried and eaten by the inhabitants, either roaſted or raw. In the Weſt-Indies too, the leaves of ſome of the ſorts, particularly that with a water-lily-leaf, are boiled and eaten as greens; hence the names of Indian kale, and eſculent arum, which have been given to this ſpecies.

The native Indians in North-America, boil the ſpadix and berries of the Virginian arum, which they eſteem as a dainty. Theſe berries, when raw, have a harſh pungent taſte, which they loſe in a great meaſure by being boiled. They eat likewiſe the roots, which often grow to the thickneſs of a man's thigh, and when freſh, have a pungent taſte, and are reckoned poiſonous. For this reaſon they never venture to eat them till the deleterious juice has been totally expelled by the force of fire, when they devour them with great avidity. Prepared in this manner, they taſte like potatoes. This ſpecies, however, is never, like thoſe mentioned in the preceding paragraph, dried and preſerved for uſe, but taken freſh out of the marſhes as it is wanted.

From

From the root of *Calla Æthiopica*, the *Arum Æthiopicum* of Commelyn, the Hottentots, we are told, prepare a farinaceous ſubſtance, which they uſe inſtead of bread, and which, by the Europeans at the Cape, is commonly called Hottentot-bread. Its acrimony they extract by boiling it in two or three freſh waters, after which, they adapt it to their taſte by drying it in the ſun, and roaſting it in embers. The flower of this ſpecies of *calla* is white, as was obſerved above, and of a fragrant ſmell reſembling muſk. The root is white and large, and, when cut in ſlices, ſays Kolben, bears ſo ſtrong a reſemblance to Spaniſh radiſh, that the Cape Europeans, for the ſake of amuſement, frequently paſs the former upon ſtrangers for the latter. But the mirth, he continues, of this deceit, is frequently ſpoiled by the reſentment of the deceived. For ſo very tormenting is the effect of the *arum* upon the palate, and to ſuch a degree doth it ſting and inflame the mouth, that the pain is ſcarcely ſupportable, and greatly exaſperated by the drinking of water, to which a ſtranger is always tempted to have recourſe, with a view of allaying it.

The ſucculent fruits of the genus *pothos* are eaten like ſtrawberries.

The ſtalks of ſweet-ruſh, when rubbed, emit a very agreeable aromatic ſmell, as do the leaves when broken. The roots are ſometimes uſed in decoction.

The natives of the Aſiatic iſlands chew inceſſantly with the areca-nuts the leaves of a ſpecies of pepper, termed betel. They commonly wrap up a quarter of an areca-nut in ſome betel leaves, and ſo chew them together. This juice, which they pretend fortifies their gums and ſtomach, is as red as blood, and gives a like tincture to the ſpittle and lips, but blackens the teeth prodigiouſly. The taſte, at firſt, is ſaid to be inſupportably acrid.

Pepper of Senegal is different from that of India. The plant bears a round berry about the bigneſs of hemp ſeed, which, when ripe, is of a beautiful-red colour, and of a ſweetiſh taſte. It contains a ſeed of the ſhape and bigneſs of a grain of cabbage, but very hard, and poſſeſſing an agree-able

able poignancy. The berries grow in ſmall bunches on a ſhrub that is three or four feet high, and has thin ſupple branches, furniſhed with oval leaves, that are pointed at the ends, very greaſy, and not unlike thoſe of the privet.

PISTILLUM, (properly a peſtle to pound, or ſtamp with, in a mortar—a *pinſo, piſtum, id eſt, tundo*, to beat) the peſtle, piſtil, or pointal; an erect column, generally placed in the centre of the flower, within the ſtamina, and ſuppoſed by the ſexualiſts to be the female organ of generation in plants. Its parts are three.

I. The *germen*, or ſeed-bud, which exiſts before the burſting of the anthers, and is, in fact, the rudiments of the ſeed-veſſel, vulgarly called the fruit. This is the baſe or lower part of the pointal.

II. The ſtyle or *vagina*, elevated by the ſeed-bud. From the number of ſtyles, not of ſeed-buds, ariſe the orders or ſecondary diviſions in the Sexual Method.

III. The *ſtigma*, or ſummit of the ſtyle, which receives the *pollen* or male duſt, upon its diſperſion by the burſting of the *anthers*, and tranſmits it elaborated to the ſeed-bud below.

Each of theſe principal parts of the flower is particularly explained under its reſpective term.

PLACENTATIO, a term of habit, expreſſive of the diſpoſition of the ſide-lobes of the ſeed, or ſeminal leaves, about the time of the ſprouting of the embryo plant. *Vide* COTYLEDONES.

Some plants have no ſeed-leaves, ſome have one, but the greater number riſe with *two*. *Vide* ACOTYLEDONES, MONOCOTYLEDONES, and DICOTYLEDONES.

PLANIPITALÆ, (from *planus*, flat, plain, and *petalum*, a petal or flower-leaf,) the name of a claſs in Ray's Method, conſiſting of plants with compound flowers, compoſed of florets with flat or plain tongue-ſhaped petals. The term is exemplified in ſuccory, dandelion an hawkweed, and correſponds to the *ſemifloſculoſi* of Tournefort.

PLENUS *flos*, a full flower; a term expreſſive of the higheſt degree of luxuriance in flowers. The petals in full flowers are ſo multiplied, as to exclude all the ſtamina, and

frequently

frequently to choak up the female organ, so that such flowers, although the most delightful to the eye, are both vegetable monsters and vegetable eunuchs: the unnatural increase of the petals constituting the first; the consequent exclusion of the stamina or male organs, the latter.

Flowers with more petals than one are most liable to this, as well as the inferior degrees of luxuriance. The following are well-known examples; ranunculus, anemone, marsh-marigold, columbine, fennel-flower, poppy, paeony, pink, gilliflower, campion, viscous campion, lily, crown imperial, tulip, narcissus, rocket, mallow, Syrian mallow, apple, pear, peach, cherry, almond, myrtle, rose, and strawberry.

Flowers with one petal are more rarely subject to fullness. That they are not, however, totally exempted, appears from polianthes, hyacinth, primrose, crocus, meadow-saffron, and thorn-apple. With these familiar examples before his eyes, Krämer did not hesitate to assert, that a full flower with one petal, is a contradiction in terms.

In flowers with one petal, the mode of luxuriance, or impletion, is, by a multiplication of the divisions of the limb or upper part; in flowers with more petals than one, by a multiplication of the petals or nectarium.

To take a few examples: columbine is rendered full in three different ways; 1. by the multiplication of its petals, and total exclusion of the nectaria; 2. by the multiplication of the nectaria, and exclusion of the petals; or, 3. by such an increase of the nectaria only, as does not exclude the petals, between each of which are interjected three nectaria, placed one within another. Again, fennel-flower is rendered full, by an increase of the nectaria only; narcissus either by a multiplication of its cup and petals, or of its cup only; lark-spur, commonly by an increase of the petals, and exclusion of the spur, which is its nectarium. In *saponaria concava anglica*, the impletion is attended with the singular effect of incorporating the petals, and reducing their number from five to one; and in gelder-rose, the luxuriance is effected by an increase both in magnitude, and

 number,

number of the plain, wheel-ſhaped, barren-florets of the circumference of the head of flowers, and an excluſion of all the bell-ſhaped hermaphrodite florets of the centre.

Hitherto we have treated of plenitude in ſimple flowers only: the inſtance juſt now adduced ſeems to connect the different modes of impletion in them and compound flowers. Before I proceed further, however, it will not be improper to premiſe, that as a ſimple luxuriant flower is frequently, by beginners, miſtaken for a compound flower in a natural ſtate, ſuch flowers may always be diſtinguiſhed with certainty by this rule: that in ſimple flowers, however luxuriant, there is but one *piſtillum* or female organ; whereas in compound flowers each floret, or partial flower, is furniſhed with its own proper *piſtillum*. Thus in hawk-weed, a compound flower, each flat or tongue-ſhaped floret in the aggregate has its five *ſtamina* and naked ſeed; which laſt is, in effect, its *piſtillum*: whereas, in a luxuriant lychnis, which is a ſimple flower, there is found only one *piſtillum* or female organ common to the whole.

In a compound radiated flower, which generally conſiſts of plain florets in the radius, and tubular or hollow florets in the diſk, plenitude is effected either by an increaſe of the florets in the margin, and a total excluſion of thoſe in the centre; which mode of luxuriance is termed impletion by the radius, and reſembles what happens in the gelder-roſe: or by an elongation of the hollow florets in the centre, and a leſs profound diviſion of their brims; which is termed impletion by the diſk.

In the firſt mode of luxuriance, the florets in the centre, which are always hermaphrodite or male, are entirely excluded; and in their place ſucceed florets ſimilar in ſex to thoſe of the *radius*. Now, as the florets in the margin of a radiated compound flower are found to be always either female, that is, furniſhed with the *piſtillum* only; or neuter, that is, furniſhed with neither *ſtamina* nor *piſtillum*; it is evident, that a radiated compound flower, filled by the *radius*, will either be entirely female, as in fever-few, daiſy, and African marigold; or entirely neuter, as in ſun-flower, marigold,

marigold, and centaury. Hence it will always be eafy to diftinguifh fuch a luxuriant flower from a compound flower with plain florets in a natural ftate; as thefe florets are all hermaphrodite, that is, furnifhed with both *ftamina* and *piftillum*. Thus the full flowers of African marigold have each floret furnifhed with the *piftillum* or female organ only: the natural flowers of dandelion, which, like the former, is compofed of plain florets, are furnifhed with both *ftamina* and *piftillum*.

In the fecond mode of luxuriance, termed impletion by the difk, the florets in the margin fometimes remain unchanged; but moft commonly adopt the figure of thofe in the centre, without, however, fuffering any alteration in point of fex; fo that confufion is lefs to be apprehended from this mode of luxuriance than from the former. Befides, the length to which the florets in the centre run out, is, of itfelf, a fufficient diftinction, and adapted to excite at once an idea of luxuriance. Daify, fever-few, and African marigold, exhibit inftances of this as well as of the former mode of impletion.

In luxuriant compound flowers with plain florets, the *femi-flofculofi* of Tournefort, the *ftigma* or fummit of the ftyle in each floret is lengthened, and the feed-buds are enlarged and diverge; by which characters fuch flowers may always be diftinguifhed from flowers of the fame kind in a natural ftate. Scorzonera, nipple-wort, and goat's-beard, furnifh frequent inftances of the plenitude alluded to.

Laftly, the impletion of compound flowers with tubular or hollow florets, the *flofculofi* of Tournefort, feems to obferve the fame rules as that of radiated flowers juft delivered. In everlafting flower, the *xeranthemum* of Linnæus, the impletion is fingular, being effected by the enlargement and expanfion of the inward chaffy fcales of the calyx. Thefe fcales, which become coloured, are greatly augmented in length, fo as to over-top the florets, which are fcarce larger than thofe of the fame flower in a natural ftate. The florets too in the margin, which in the natural flower are female, become, by luxuriance, barren; that is, are deprived of the

 piftillum;

pistillum; the style, which was very short, spreads, and is of the length of the chaffy scales, and its summits, formerly two in number, are metamorphosed into one.

Full flowers are more easily referred to their respective genera in methods founded upon the calyx, as the flower-cup generally remains unaffected by this highest degree of luxuriance.

PLUMULA, a little feather; the scaly part of the *corculum* or embryo plant within the seed, which ascends and becomes the stem or trunk. It extends itself into the cavity of the lobes, and is terminated by a small branch resembling a feather, from which it derives its name. *Vide* CORCULUM and GERMINATIO.

POLLEN, properly fine flower, or the dust that flieth in the mill. By Columella it is used of the fine dust or powder of frankincense—in Botany, the fecundating or fertilizing dust contained within the anthers or tops of the *stamina*, and dispersed upon the female organ when ripe, for the purpose of impregnation. *Vide* SEXUS *Plantarum*.

This dust corresponding to the seminal fluid in animals, is commonly of a yellow colour, and very conspicuous in the summits of some flowers, as tulip and lily. Its particles are very minute, and of extreme hardness. Examined by the microscope, they are generally found to assume some determinate form, which often predominates, not through all the species of a particular genus only, but also through the genera of a natural family or order.

The powder in question being triturated and otherwise prepared in the stomach of the bees, by whom great quantities are collected in the hairy brushes with which their legs are covered, is supposed by some authors to produce the substance known by the name of wax; a species of vegetable oil, rendered concrete by the presence of an acid, which must be removed before the substance can be rendered fluid.

POLYADELPHIA (πολυς, many, and ἀδελφία, a brotherhood) many brotherhoods. The name of the eighteenth class in Linnæus's Sexual System, consisting of plants with hermaphrodite

hermaphrodite flowers, in which ſeveral *ſtamina* or male organs are united by their filaments into three or more diſtinct bundles.

This claſs, which contains very few genera, is ſubdivided into four orders from the number of *ſtamina*.

Chocolate-nut has five *ſtamina*, or rather five bundles of *ſtamina*, each filament having five *anthers* or tops.

Monſonia has fifteen *ſtamina* in five bundles.

Citron, orange, and lemon, which belong to the ſame genus, *citrus*, have twenty *ſtamina* formed into a great number of bundles.

Melaleuca, *hopea*, St. John's wort, and St. Peter's wort, have many *ſtamina*, which, in the three former, are collected into five, in the latter, into four bundles.

POLYANDRIA (πολυς, many, and ανηρ, a man, or huſband) many huſbands; the name of the thirteenth claſs in Linnæus's Sexual Method, conſiſting of plants with hermaphrodite flowers furniſhed with ſeveral *ſtamina* that are inſerted into the common receptacle of the flower. By this circumſtance chiefly, though not expreſſed in the title, is the claſs under conſideration diſtinguiſhed from that immediately preceding it, termed *icoſandria*, in which, although a numeral claſs, the moſt ſtriking character is the ſituation of the *ſtamina*, which are inſerted into the calyx or petals, or both. The number of *ſtamina* in the two claſſes being indeterminate, would frequently claſh, and hence create miſtakes: their inſertion is an invariable character, and therefore an unerring mark of diſtinction.

This numerous claſs of plants, the fruits of which are frequently poiſonous, is ſubdivided into ſeven orders, from the number of the ſtyles or female organs.

Poppy, herb-chriſtopher, rock-roſe, and water-lily, have one female organ.

Pæony, and *calligonum*, have two ſtyles, or female organs.

Lark-ſpur, and monk's-hood, have three; *tetracera* has four.

Columbine,

Columbine, and fennel-flower, have five; water-foldier, or marfh-aloe, fix; virgin's-bower, meadow-rue, hellebore, marfh-marigold, anemone, globe-ranunculus, cuftard-apple, tulip-tree, magnolia, ranunculus, and adonis, have many ftyles.

POLYANGIÆ (πολυς, many, and ἀγγ☉, a veffel) the name of the twentieth clafs in Boerhaave's Method, confifting of plants which have many capfules, or a fingle capfule divided into numerous cells. It is exemplified in marfh-marigold, hellebore, globe-ranunculus, and water-lily.

POLYGAMIA (πολυς, many, and γαμ☉, marriage) polygamy. This term, expreffing an inter-communication of fexes, is applied, by Linnæus, both to plants and flowers. A polygamous plant is that which bears both hermaphrodite flowers and male or female, or both. This will be particularly explained below. Polygamy of flowers refpects the inter-communication of the florets in a compound flower. The different modes of polygamy in compound flowers, arifing from the different combinations of fexes, have been adopted by Linnæus as very proper circumftances, in a method founded upon the fexes, for fubdividing that numerous and difficult clafs of plants. The fubject, therefore, of the polygamy of flowers falls more properly to be handled under the article SYNGENESIA, whither we refer our readers.

POLYGAMIA, is likewife the name of the twenty-third clafs in Linnæus's Sexual Method, confifting of polygamous, or mongrel plants, that is, plants having hermaphrodite flowers, and likewife male or female flowers, or both.

A plant to be polygamous muft have fome of its flowers hermaphrodite: for by that circumftance alone is its connection cut off with the plants of the claffes *monœcia* and *diœcia*, in the former of which the plants are androgynous, that is, bear male and female flowers upon the fame root; in the latter, male and female. This rule, however, admits of a few exceptions, which will be mentioned afterwards.

wards. Further, the polygamy may be either on the fame plant, or on diftinct plants from the fame feed. The modes of which it is fufceptible, are as follows:

I. Hermaphrodite and male flowers on the fame plant, as in white hellebore, nettle-tree, crofs-wort, and ægilops. This kind of polygamy is likewife obfervable in feveral of the umbelliferous plants, particularly carrot, fanicle, hog's-fennel, coriander, chervil, fhepherd's-needle, Alexanders, carui, and baftard-parfley. Thefe plants, therefore, ought, in ftrict conformity to the principles of the Sexual Method, to have been arranged under the clafs *polygamia*; though I think Linnæus has judged far better to place them with the other umbelliferous flowers, as fo unnatural a feparation muft have ftruck a fatal blow at the very root of his fyftem. It is evident, however, that the fame objection continues in force againft the principles of his method; fince, if carried into rigid execution, they have a direct tendency to commit the moft violent outrages againft Nature, by disjoining things which were never meant to be feparated.

II. Hermaphrodite, and male flowers on diftinct plants, as in palmetto, ginfeng, Indian-date plum, and tupelo-tree.

III. Hermaphrodite and female on the fame plant, as in pellitory and orach.

IV. Hermaphrodite and female on different plants, as in moft fpecies of afh-tree.

V. Androgynous and male upon diftinct roots, as in *arctopus*, and amber-tree, which have male and female flowers upon one plant, and male flowers only on the other.

VI. Androgynous, male and female upon three diftinct plants, as in carob-tree and fig-tree. This and the former cafe, having no hermaphrodite flowers, feem to be exceptions to the definition of polygamous plants given above.

VII. Hermaphrodite, male and female upon two diftinct plants, as in three-thorned *acacia*, in which the male and hermaphrodite flowers are placed upon one plant, and the female flowers on the other.

VIII.

VIII. Male hermaphrodites, and female hermaphrodites on the ſame plant; that is, flowers which, although they contain the parts proper to each ſex, have one of the parts reciprocally abortive; the *ſtamina* or male organ in ſome, the *piſtillum* or female organ in others. In the former caſe they are ſtiled female hermaphrodites, in the latter, male hermaphrodites, according as either ſex is predominant. This ſingular mode of polygamy, if it can be called ſuch, is obſerved in the flowers of plantain or banana tree.

POLYSPERMÆ, (πολυς, many, and σπερμα, a ſeed) the name of the fifteenth claſs in Ray's Method, conſiſting of plants with many capſules or ſeeds. It is exemplified in marſh-marigold, hellebore, and globe ranunculus.

POLYSTEMONES (πολυς, many, and στημων, a ſtamen) the name of the eighth claſs in Haller's Natural Method, conſiſting of plants which, as the name imports, have many *ſtamina* or male organs. It is exemplified in poppy, ranunculus, mallow, cherry, and roſe. The *ſtamina* in this claſs are generally triple the number of petals.

POMACEÆ (*pomum*, an apple) the name of the thirty-ſixth order in Linnæus's Fragments of a Natural Method, conſiſting of the following genera, which have a pulpy eſculent fruit of the apple, berry, and cherry kind.

	Linnæan Genera.			*Engliſh Names.*
α	*Cratægus*,	—	—	Wild-ſervice thorn.
	Meſpilus,	—	—	Medlar.
	Pyrus,	—	—	Apple, pear.
	Ribes,	—	—	Currant-tree.
	Sorbus,	—	—	Service-tree.
	Spiræa,	—	—	Spiræa frutex, ſpiked willow, drop-wort.
β	*Punica*,	—	—	Pomegranate.
γ	*Amygdalus*,	—	—	Almond-tree, peach.
	Chryſobalanus,		—	Cocoa-plum.
	Prunus,	—	—	Plum, apricot, cherry.

Habit and Structure of the Plants of this Order.

The plants of this order, which furnifhes many of our moft efteemed fruits, are moftly of the fhrub and tree kind.

The ROOTS are branched, fibrous, and in the greater part very long. In dropwort, the *fpiræa filipendula* of Linnæus, they confift of a great number of oval knobs or glandules, which hang, or are faftened together by flender fibres; from which circumftance are derived both its Englifh and fcientific names.

The STEMS and branches are cylindric. Thefe laft are placed alternate; and, when young, are, in fome genera, angular. The bark is thick and wrinkled.

The BUDS are of a conic form, placed in the angles of the leaves, and covered with fcales which lie over one another like tiles. In apple, pear, plum, apricot, cherry, almond, and peach trees, befides the buds of the leaves, there are fcaly buds, or eyes, of a different form, from which proceed bundles or clufters of flowers. *Vide* GEMMA.

The LEAVES, which differ in form, being in fome genera fimple, in others winged, are, in the greater number, placed alternate. Thofe of medlar, wild-fervice, fpiræa with marfh-elder leaves, and fome others, have their furface covered with fmall fhining fpots, which refemble minute points or holes.

The foot-ftalk of the leaves is furrowed above, and frequently accompanied, as in the cherry-tree, with a number of knobs in the form of glands.

Moft of thefe plants are furnifhed with two STIPULÆ at the origin of the young foot-ftalks of the leaves. Thefe, in fome genera, are pretty large; in others they are fo fmall as fcarce to be perceived; and in cocoa-plum, in particular, they, by their minutenefs, refemble hairs. In apple, prune, cherry, and almond-trees, the appearances in queftion fall off before the leaves.

The

The branches of apple, pear, and medlar trees are terminated by a thorn. The ſtem of hawthorn and bullace-tree, a ſpecies of *prunus*, is cloſely armed with offenſive weapons of the ſame kind. Theſe ſpines, however, though protruded from the wood, totally diſappear by culture.

The FLOWERS are univerſally hermaphrodite, except in *ſpiræa aruncus*, in which male and female flowers are produced upon diſtinct plants.

In the greater number of genera they are produced in cluſters or heads (*corymbi*) at the end of the branches. Many of theſe flowers are eaſily rendered double by culture.

The FLOWER-CUP is of one piece with five diviſions, which are permanent, and placed above the ſeed-bud in ſpiræa, apple, pomegranate, ſervice, wild-ſervice, medlar, and currant-trees; in the reſt they either fall off with the flower, or wither upon the ſtalk.

The PETALS are five number, and inſerted into the tube of the calyx.

The STAMINA are generally twenty and upwards, and attached, like the petals, to the margin of the tube of the calyx.

The ANTHERS are ſhort, and ſlightly attached to the filaments.

The SEED-BUD is ſingle, and in thoſe genera which have the calyx permanent, it is placed below the receptacle of the flower.

The SEED-VESSEL is a pulpy fruit of the apple, berry, or cherry kind. Thoſe of the apple kind are divided internally into a number of cells. Pomegranate has nine cells, apple and pear five.

The SEEDS in pomegranate, apple, and currant-trees, are numerous; in ſervice-tree, three; in medlar, five; in wild-ſervice, two; in peach, plum, and cocoa-plum, a ſingle nut, or ſtone, containing a kernel.

The pulpy fruits of this order of plants are acid, eſculent, and of great efficacy in putrid and bilious fevers. The

The kernels of plums, cherries, and almonds, contain a great quantity of oil, and, when bitter, are ſaid to be highly pernicious to certain animals, particularly birds which feed on them. The fruit of the wild apple-tree yields, by expreſſion, an acid juice, which being fermented, becomes an agreeable vinous liquor. Medlars are aſtringent and diuretic. The flowers of peach-tree are a gentle purgative. The gum of cherry and peach-trees may be ſubſtituted for gum-arabic, which, however, is greatly preferable. The wood of bird-cherry is ſudorific, yet rarely uſed in medicine. From bitter almonds is drawn by expreſſion an oil, which is anodyne, and highly proper in deafneſs, and pains of the ear.

POMIFERÆ, (*pomum*, an apple, and *fero*, to bear) the name of a claſs in Hermannus, Boerhaave, and Ray's Methods, conſiſting of plants which have a fleſhy fruit of the apple kind. It is exemplified in the pear, and pomegranate-trees.

POMUM, an apple; a ſpecies of ſeed-veſſel, compoſed of a ſucculent fleſhy pulp, in the middle of which is generally found a membranous capſule, with a number of cavities for containing the ſeeds. Seed-veſſels of this kind have no external opening or valve. At the end oppoſite to the foot-ſtalk is frequently a ſmall cavity, called by gardeners the eye of the fruit, and by botaniſts, *umbilicus*, the navel, from its fancied reſemblance to the navel in animals. Gourd, cucumber, melon, pomegranate, pear, and apple, furniſh inſtances of the ſeed-veſſel in queſtion.

PRECIÆ, (*precius*, early); the name of the twenty-firſt order in Linnæus's Fragments of a Natural Method; conſiſting of primroſe, an early flowering-plant, and a few genera which agree with it in habit and ſtructure, though not always in the character or circumſtance expreſſed in the title.

List of the Genera *contained in this Order.*

Linnæan Genera.	English Names.
Androsace.	
Aretia.	
Cortusa, —	— Bear's-ear sanicle.
Cyclamen, —	— Sow-bread.
Diapensia.	
Dodecatheon, —	— Meadia.
Primula, —	— Primrose, auricula.
Soldanella, —	— Soldanel.
β *Limosella,* —	— Least water-plantain.
γ *Hottonia,* —	— Water milfoil, or water-violet.
Menyanthes, —	— Bog-bean, or marsh-trefoil.
Samolus, —	— Round-leaved water-pimpernel.

These plants, which possess no striking uniform characters, are, in general, innocent in their quality; yet the root of sow-bread is dangerous, if taken internally.

PROLIFER *flos*; (*proles*, an offspring, and *fero*, to bear); a prolific flower, or flower which from its own substance produces another; a singular degree of luxuriance, to which full flowers are chiefly incident.

In simple flowers, the prolification arises from the seed-bud of the parent or full flower shooting up into another flower; in which case, a single foot-stalk only is protruded: in compound and aggregate flowers properly so called, it arises from the common calyx, from all parts of which are sent forth many foot-stalks, each supporting a single flower. Examples of the former mode of luxuriance are frequent in ranunculus, anemone, pink, rose, and herb-bennet: of the latter, in daisy, hawkweed, marigold, and scabious.

Simple umbelliferous flowers become prolific, by the production of another simple umbel from their centre; as in the *Cornus Mesomera* of Rivinus. In milk-parsley, and wild carrot, is protruded from the centre of the compound umbel,

bel, another univerſal umbel which overtops the former. By a further exertion of the ſame cauſe it is eaſy to conceive that this laſt umbel may likewiſe be rendered prolific; and thus a triple crown of heads of flowers be erected, each growing out of the one immediately below it.

Prolific flowers are ſaid to be frondoſe or leafy, which produce branches charged with both leaves and flowers. Inſtances of this mode of luxuriance, though rare, are ſometimes obſerved in roſe and anemone. In the full flowers of cherry-tree, the ſeed-bud frequently ſhoots up by luxuriance into a number of leaves.

PROPAGO, (properly a ſlip, layer, or cutting of a vine, or other tree; thus Virgil—"*Melius propagine vites reſpondent.*" Georg. 2. 63.) Linnæus's name for the ſeeds of the moſſes. *Vide* MUSCI.

PUBES, hair, down, a general term, expreſſive of all the hairy and glandular appearances on the ſurface of plants, to which they are ſuppoſed by naturaliſts to ſerve the double purpoſe of defenſive weapons, and veſſels of ſecretion. The different ſpecies of *Pubes* enumerated by Linnæus, are,

I. PILI, hairs.
II. LANA, wool.
III. *Barba*, a beard, or tuft of hair.
IV. TOMENTUM, a hoary, ſilver-white appearance.
V. *Strigæ*, } briſtles.
VI. *Setæ*, }
VII. HAMI, hooks.
VIII. GLANDULÆ, glands.
IX. *Glochides*, pointed hairs.
X. *Viſcoſitas*, clamminefs.
XI. *Glutinoſitas*, ſtiff clammineſs.

Many of theſe terms it is impoſſible to define with accuracy, as their differences are ſo minute, that an adequate idea of the appearances can only be obtained by ſight. The more ſtriking kinds of *Pubes*, ſuch as *tomentum*, *glandulæ*, &c. are each particularly explained under its reſpective head.

In general, it may be obſerved, that hairs are minute

 threads,

threads, of greater or lefs length and folidity, fome of which are vifible to the naked eye, whilft others are rendered vifible only by the help of glaffes. Examined by a microfcope, almoft all the parts of plants, particularly the young ftalks, appear covered with hairs.

Hairs on the furface of plants prefent themfelves under various forms: in the leguminous plants, they are generally cylindric; in the mallow tribe, terminated in a point; in agrimony, fhaped like a fifh-hook; in nettle, awl-fhaped, and jointed; and in fome compound flowers with hollow or funnel-fhaped florets, they end in two crooked points.

Probable, as fome experiments have rendered it, that the hairs on the furface of plants contribute to fome organical fecretion, their principal ufe feems to be, to preferve the parts in which they are lodged from the bad effects of violent frictions, from winds, from extremes of heat and cold, and fuch like external injuries.

M. Guettard, who has eftablifhed a botanical method from the form, fituation, and other circumftances of the hairy and glandular appearances on the furface of plants, has demonftrated, that thefe appearances are generally conftant and uniform in all the plants of the fame genus. The fame uniformity feems, fometimes, to characterize all the genera of the fame natural order.

The different forts of hairs which form the down upon the furface of plants were imperfectly diftinguifhed by Grew, in 1682, and by Malpighi, in 1686. M. Guettard, juft mentioned, was the firft who examined the fubject, both as a botanift and a philofopher. His obfervations were publifhed in 1747.

PUBESCENTIA, (*pubes*, hair, down) pubefcence, or hairinefs; a general term of habit, expreffive of every kind of armature, whether offenfive or defenfive, with which plants are furnifhed. The term, which is highly improper to be ufed with fuch latitude, is omitted in the later editions of Linnæus's works; the terms *pubes* and *arma*, its conftituent parts, fupplying its place.

PULMONES, the lungs. By this name, Linnæus, in affimilating

affimilating the animal and vegetable kingdoms, has diftinguifhed the leaves, the organs of perfpiration, and refpiration in plants.

PUTAMINEÆ, (*putamen*, a fhell) the name of the twenty-fifth order in Linnæus's Fragments of a Natural Method; confifting of a few genera of plants, allied in habit, whofe flefhy feed-veffel, or fruit, is frequently covered with a hard woody fhell.

Lift of the Genera *contained in this Order.*

Linnæan Genera.		English Names.
Capparis,	— —	Caper-bufh.
Cleome,	— —	Baftard-muftard.
Cratæva,	— —	Garlick-pear.
Crefcentia,	— —	Calabafh-tree.
Marcgravia.		
Morifonia.		

Moft of thefe plants are acrid, and penetrating, and yield, by burning, a great quantity of fixed alkali.

With refpect to their virtues, they are powerful aperients. The Indians pretend that the fruit of a fpecies of caper-bufh, which they call baducca, extinguifhes the flames of love.

Ptifans, baths, and fumigations of thefe plants, are greatly ufed by the Negroes at Senegal for venereal complaints, palfies, and diftempers of the fkin. Baftard-muftard is adminiftered in leprofies in the Levant.

In default of the leaves of baobab, the Negroes on the coaft of Guinea mix thofe of garlick pear-tree, which fmell very ftrong, in their ordinary food called coufcous.

The flower-buds of caper-bufh, preferved with vinegar, furnifh the pickle well known by the name of capers.

The fruit called calabafh, is of two kinds, the one fmall and round, the other large and oval. The trees which bear both fruits are as large and fpreading as an apple-tree. The fruit, when largeft, is about the fize of a man's head, and when

when carefully cleared of its pulp, capable of holding fifteen pints of water, or other liquid, for which purpofe its fcooped fhell, which is as thin and light as brown paper, is chiefly ufed by the inhabitants of the Weft-Indies. At Barbadoes, befides drinking-cups and punch-bowls, there are made of the calabafh-fhells, fpoons, difhes, and other eating utenfils for the flaves: the pulp is foft, four, and unfavoury, and feldom eaten, except by the cattle, in time of drought: the wood, which is hard and fmooth, is frequently made into ftools, chairs, and other furniture.

The leaves and fruit of *cratæva* fmell ftrongly of garlick; whence the name of garlick pear-tree by which this genus has been diftinguifhed. The fruit, which in one fpecies is fmooth, and in the other, prickly, grows to the fize of an orange, and has its infide filled with an agreeable pulp, interfperfed with fmall granulated feeds. The tender buds from the young branches being bruifed, and applied as a plafter to any part of the body, will, in time, raife as regular a blifter as that occafioned by cantharides.

R.

RACEMUS, properly fignifies a bunch or clufter of grapes. In a fcientific fenfe it is ufed to fignify a mode of flowering, in which, the flowers placed along a common foot-ftalk, are furnifhed with fhort proper foot-ftalks, proceeding as lateral branches from the common flower-ftalk. It is exemplified in the vine and currant-tree.

A clufter refembles a fpike, in having its flowers placed along the fides of a common foot-ftalk, but differs from it in being furnifhed with proper flower ftalks; whereas the flowers of the fpike are placed immediately upon the fides of the common foot-ftalk, and are feldom produced in fuch abundance. *Vide* SPICA.

Again, a clufter differs from that mode of flowering termed a corymbus, in the fhortnefs and equal length of its branches or proper flower-ftalks, which in thofe of the corymbus, rife to fuch a proportionable height, as to form an

an even surface at top; by which means, each lower flower-stalk is considerably longer than that immediately above it. *Vide* CORYMBUS.

RADIATUS *flos*. *Vide* COMPOSITUS *flos*.

RADIATI, the name of the fourteenth class in Tournefort's Method, consisting of compound radiated flowers, that is. compound flowers with plain florets in the margin, and hollow florets in the centre. It is exemplified in groundsel, feverfew, milfoil, marigold, and daisy.

RADICATIO, (*radix*, a root) a term of habit, expressive of the form and disposition of the root. *Vide* BULBUS and RADIX.

RADICULA, (diminutive from *radix*, a root) a little root: the stringy or fibrous part of the root, which generally terminates the stock or main root, and penetrating into the soil, attracts moisture and nourishment for the support of the vegetable. The radicle is, in fact, the principal and essential part of every root, and is therefore never wanting, not even in those plants improperly stiled imperfect: for the mosses, lichens, and submarine plants, discover a remarkable analogy in the *lamellæ* and *striæ*, by which they adhere to the bodies placed under them, to the radicles, or stringy fibres, which are present in other plants.

RADIUS. *Vide* COMPOSITUS *flos*.

RADIX, the root; the lower part of the plant, generally hid below the surface of the earth, and destined for attracting the moisture from the soil, and communicating it to the other parts, *viz*. the herb and the fructification which are produced from it.

The root consists of two parts; the *caudex*, stock, or main root, and the *radiculæ*, or small stringy roots, depending from the other. *Vide* CAUDEX and RADICULA.

Main roots, with respect to form, are of three kinds; bulbous, tuberous, and fibrous. The first sort has been fully considered under the head BULBUS.

Tuberous or knobbed roots, are fleshy, solid, hard, commonly thicker than the base of the stem, and composed either of one knob, as in radish, turnip, and carrot; or, of

 many

many collected into a bunch, as in pœony, ſun-flower, and drop-wort: in the laſt of which plants, ſeveral ſmall roundiſh bodies hang, or are faſtened together by a number of ſlender ſtrings, or filaments.

In tuberous roots, the radicles or ſmall ſtringy roots are generally diſperſed over the whole ſurface: in which reſpect, they differ eſſentially from bulbous roots, in which the radicles are confined to the bottom of the bulb, that part only being the genuine root; the bulb itſelf ſerving as a large bud under ground, for incloſing and protecting the embryo plant.

The roots of arum, orchis, moſchatelline, and ſome other plants, although tuberous, emit fibres at the top, from a knot formed betwixt the trunk and the thicker part of the root. Such roots, from the fibres which adhere to the top of the fleſhy maſs reſembling a buſh of hair, have been diſtinguiſhed by the name of *radices comoſæ*.

Fibrous roots are ſlenderer than the baſe of the trunk, and are either divided by equal branches, as in the greater number of trees, in which, likewiſe, the ſubſtance is woody; or conſiſt of a number of ſingle fibres like hairs, which proceed from the ſmall knot, or baſe of the ſtem, as in many graſſes. This laſt kind of fibrous root is termed *radix capillacea*.

With reſpect to direction, roots are ſaid to be perpendicular, which run directly downwards. The term is moſt commonly applied to a particular kind of root, which, not exceeding in dimenſion the baſis of the ſtem, deſcends perpendicularly downwards in one ſtraight fibre that is thicker in the upper part, and gradually tapers downwards. It is exemplified in carrot, parſnep, radiſh, and ſuch like roots, which, from their tapering ſhape, have properly enough obtained the name of *radices fuſiformes*, or ſpindle-ſhaped roots.

Spindle-ſhaped roots are a ſpecies of tuberous root, as appears from the ſituation of the ſtrings or fibres, which are diſperſed over the whole ſurface of the ſtock or principal root, and divided into numerous branches, which, after ſeveral ſubdiviſions, become as fine as hairs. This kind of

tapering

tapering root is frequently changed by culture into a round, knobbed, or tuberous root properly ſo called, as in ſome umbelliferous plants.

Horizontal, level, or tranſverſe roots, extend themſelves horizontally under the ſurface of the ground; as in iris, maſterwort, hop, biſhop's weed, cinquefoil, and all ſuch as properly creep.

Of horizontal roots, ſome run very near the turf, as woodbine and wild anemone: others lower down, as couch-graſs.

Of perpendicular roots, ſome ſtrike down but a little way, as thorn-apple: others pierce deep, as horſe-radiſh.

The direction of roots is alſo ſometimes compounded. Thus, the main root or ſtock of primroſe, is level; the radicles, or ſtrings, run perpendicular.

With reſpect to diviſion, roots are entire, as liquorice, or parted, as St. John's wort, forked or parted at the bottom, as in moſt roots, or at the top, as in dandelion, and ſome others.

The roots in radiſh are ſtraight: in biſtort, crooked; in rhubarb, thick; in vine, ſlender; long, in fennel; ſhort, in turnip; in eryngo, cylindrical; in borage, pyramidal. Some are uneven and pitted, as potatoes, where the eyes, or buds of the future trunk, lie inward; or knotty, as Jeruſalem artichoke, where they ſtand out.

Roots, in point of duration, are either annual, biennial, or perennial; that is, of one, two, or many years continuance: the two firſt are attributes of herbaceous vegetables only; the latter, is applicable both to herbs and trees. In ſome plants, both root and ſtem ſubſiſt for many years. Of this kind are all trees; the roots of which may be termed, by way of diſtinction, *radices fruticoſæ*. In others, the roots only ſubſiſt during the winter, whilſt the ſtalks, which decay and periſh, are annually renewed from the root. Of this kind, are all thoſe herbs, from this circumſtance termed perennial. Biennials renew their ſtalk only twice; annuals exiſt but for a year, at the end of which time, both ſtem

 and

and root periſh, and the individual is at an end. Theſe laſt as is evident, can only be propagated from ſeed.

Uniform and conſtant as Nature is in all her productions, there are many perennial roots which become annual, when tranſplanted into cold climates. Nay, there are not wanting examples of ſhrubs loſing their ſtems annually in ſuch climates, in the ſame manner as the ſtalks of herbaceous vegetables periſh in autumn, whilſt the root continues in full vigour: ſometimes even, in ſuch circumſtances, the ſhrub not only diveſts itſelf of its woody ſtem, and becomes herbaceous, but is metamorphoſed, in every reſpect, into an annual plant, and loſes both its ſtem and root at the end of one year. (*Vide* Methodus.) Culture, on the other hand, may prolong the life of annuals. Thus, M. Duhamel mentions a root of barley, which put forth new ſtalks after the old ones were cut down in harveſt, and produced a ſpike of flowers the following year.

Among the accidents that happen to roots from an exceſs of culture, or a luxuriance of nouriſhment, may be reckoned the monſtrous appearance of the roots of ſome potatoes, which, although generally ſix inches long, and three broad, are ſometimes found eighteen inches, and two feet long, and one foot in diameter. Thoſe of turnip, in like manner, are ſometimes found increaſed to the enormous ſize of nine or ten inches in diameter, although, in general, they ſeldom exceed three or four.

Roots, as we obſerved in the definition, are generally hid below the ſurface of the ground, and derive their nouriſhment immediately from the ſoil. This is a general law of vegetable nature, but like moſt other general laws, admits of exceptions. The roots of miſtletoe, vanelloe, dodder, *hypociſtis*, and ſome others, do not penetrate into the ſoil, and ſeek nouriſhment for themſelves, but derive it, as by ſtealth, from other plants, to which they attach themſelves. Such plants, from the ſingular circumſtance juſt mentioned, are termed paraſitic.

Miſtletoe and vanelloe cling to the branches of trees, *hypociſtis*

ciſtis to the roots of plants, particularly of *ciſtus*, or the rock-roſe, whence it derives its name: dodder, to the ſtems of all ſorts of plants, though it is generally known by the name of *epithymum*, or thyme-weed, as if it were only to be found on the plant of that name.

The manner in which paraſitic plants attach themſelves to others, is not uniform. The ſeed of dodder germinates in the ground, and puts forth a ſtem, which attaches itſelf to the firſt plant it encounters in its progreſs. From this plant it attracts the nouriſhing juices, by means of certain ſecretory glands with which the ſtem is furniſhed. Mean time, the lower part of the ſtem, which is detached from the ſupporting plant, and receives no part of the nouriſhment, dries up; its firſt root dies, and the plant continues to live and be nouriſhed at the expence of that upon which it is fixed.

On the other hand, miſtletoe, vanelloe, and *hypociſtis*, are produced originally upon the plant which affords them nouriſhment: the two former, which grow upon large trees, extend their roots under the bark, and penetrate inſenſibly into the body of the wood.

Other paraſitical plants, conſiſting of ſmall tubercles, emit fibrous roots, which often penetrate the bulbs of ſaffron, extract all the ſubſtance, and hence occaſion the ſudden death of the parent or ſupporting plant.

Some roots attach themſelves to the hardeſt bodies, as the moſſes to the bark of trees, the lichens to ſtones and rocks, nouriſhed, without doubt, by the humidity of the air abſorbed by their leaves, or branches. Other plants ſwim upon the ſurface of the water, as *lemna*, or duck's meat, which grows upon ſtanding waters in moſt parts of England, and, if not diſturbed, will ſoon cover the whole ſurface. Some plants appear to be totally devoid of roots; ſuch are many of the *Algæ*, particularly the genera *Byſſus* and *Tremella*.

In aſſimilating the animal and vegetable kingdoms, Linnæus, properly enough, compares the root in plants to the lacteal veſſels in animals. The ſoil, or earth, is the vegetable ſtomach; the trunk, its bones; the leaves, its lungs; and

and heat its heart: analogies, which probably ſuggeſted the epithet of *inverted animal*, ſo frequently beſtowed upon plants by the ancient naturaliſts.

RECEPTACULUM, (properly, a place to receive or keep things in) one of the ſeven parts of fructification, defined by Linnæus to be the baſe which connects or ſupports the other parts. The different ſpecies of receptacle enumerated by Linnæus are theſe:

I. A Proper Receptacle, which ſupports the parts of a ſingle fructification. Of this kind is the receptacle of all ſimple flowers.

II. A Common Receptacle, which is common to an aggregate or head of flowers. Of this kind is the receptacle of compound and other aggregate flowers. *Vide* Aggregatus *flos*.

III. Umbella.
IV. Cyma.
} Theſe two would have been more properly denominated Modes of Flowering.

V. Spadix.

The firſt of theſe receptacles only falls to be conſidered in this place. The ſecond, which admits of the greateſt number of varieties, and is chiefly employed in diſcriminating the genera of compound flowers, will naturally enter into the deſcription of that numerous and difficult claſs of plants. The other three, to which the name of receptacle ſeems totally miſapplied, are ſufficiently explained, each under its reſpective head.

A proper receptacle obtains different names from the parts of the fructification which it ſupports and connects. When both flower and fruit are ſupported by it, it is generally ſtiled the receptacle of the fructification, and not ſeldom the common receptacle. This laſt term, though ſomewhat improper, I have generally adopted in deſcribing ſeveral natural orders of ſimple flowers that occur in the courſe of this work. Again, when the receptacle ſupports the parts of the flower only, it is called the receptacle of the flower. In ſuch caſes, the ſeed-bud or fruit, which is placed below the receptacle of the flower, has a proper baſe of its own, which is diſtinguiſhed by the name of receptacle of the

fruit.

fruit. Of this French-willow and tree-primrofe furnifh examples.

In fome fimple flowers which have the feed-bud placed above the receptacle of the flower, the fruit has a feparate receptacle. This obfervation is particularly exemplified in magnolia, tulip-tree, cuftard-apple, and the other genera of the natural order *coadunatæ*, in which the numerous feed-buds are feated upon a receptacle, which rifes like a pillar above the receptacle of the flower. *Vide* COADUNATÆ.

Again, The term receptacle is often ufed to fignify the bafe to which the feeds are faftened within their inclofure or veffel. Inftances of the application of this term are furnifhed by deadly night-fhade, winter-cherry, hen-bane, tobacco, thorn-apple, mullein, and many other plants. This fort of receptacle is commonly known among botanifts by the name of *placenta*, from its being the common receptacle of the umbilical veffels, which ferve to tranfmit the nourifhment to the feeds.

RESUPINATIO. *Vide* INTORSIO.

RHŒADEÆ, (*rhoeas*, Linnæus's name, after Diofcorides, for the red poppy) the name of the twenty-feventh order in Linnæus's Fragments of a Natural Method, confifting of poppy, and a few genera which refemble it in habit and ftructure.

Lift of Genera contained in this Natural Order.

Linnæan Genera.			*Englifh Names.*
Argemone,	—	—	Prickly poppy.
Bocconia.			
Chelidonium,	—	—	Celandine.
Papaver,	—	—	Poppy.
Podophyllum,	—	—	Duck's-foot, or May apple.
Sanguinaria,	—	—	Puccoon.

Thefe plants, upon being cut, emit plentifully a juice, which is white in poppy, and yellow in the others. From the

the inſpiſſated juice of the heads and leaves of black poppy, is prepared the extract well known by the name of opium. The taſte of theſe plants is, in general, acrid and bitter; the petals of poppy are ſomewhat ſweet.

With reſpect to their virtues, they ſeem to operate principally upon the nerves. Their juice is ſodorific and narcotic, their ſeeds leſs ſo, their roots aperient. Applied externally, they are ſlightly corroſive.

A decoction of the roots of prickly poppy is much uſed by the Negroes of Senegal in the early ſtages of the venereal diſeaſe. The juice of celandine applied externally has the ſame effect as that of common fumatory, to deſtroy warts, and cutaneous eruptions. Mixed with a very great quantity of water, it is ſucceſsfully employed as a lotion in weakneſs of ſight, and pains of the eyes. The leaves of wild poppy are put into cooling ointments, being accounted proper for burnings, inflammations, and hot ſwellings.

With the juice of puccoon, the Indians of North-America, where the plant naturally grows, paint themſelves of a yellow colour.

ROSACEI, (*roſa*, a roſe) the name of the ſixth and twenty-firſt claſſes in Tournefort's method, conſiſting of herbs and trees with ſimple flowers, having an indeterminate number of regular petals placed circularly like thoſe of the roſe. The term is exemplified in amaranthus, purſlain, poppy, paſſion-flower and chick-weed.

ROSTELLUM (diminutive from *roſtrum*, a beak) a little bell, beak, or ſnout; the ſcaly part of the *corculum*, or embryo of the ſeed, which ſhoots downward into the ſoil, and becomes the root; its form is that of a ſmall beak placed without the lobes, and adhering internally to the *plumula*, or embryo ſtem. The term is claſſical, and as old as Columella.

ROTACEÆ, (*rota*, a wheel) the name of the twentieth order in Linnæus's Fragments of a Natural Method, conſiſting of plants with one flat wheel-ſhaped petal, (*corolla rotata*). *Vide* COROLLA.

List of the Genera *contained in this Order.*

Linnæan Genera.		*English Names.*
a *Anagallis,*	— —	Pimpernel.
Centunculus.		
Chironia.		
Exacum.		
Gentiana,	— —	Gentian, or fell-wort.
Lysimachia,	— —	Loose-strife.
Phlox,	— —	Lychnidea, or bastard lychnis.
Sarothra,	— —	Bastard-gentian.
Swertia,	— —	Marsh-gentian.
Trientalis,	— —	Winter-green with chick-weed-flowers.
ß *Ascyrum,*	— —	St. Peter's wort.
Cistus,	— —	Rock-rose.
Hypericum,	— —	St. John's wort.

The three last genera are very improperly annexed to this order, and indeed, few of the other genera can be said, in strict propriety, to possess the character specified in the title.

These plants resemble in quality those of the order PRECIÆ, to which they are in all respects very nearly allied.

The root of greater yellow gentian, the *gentiana lutea* of Linnæus, is a well known stomachic, and makes a principal ingredient in bitters. The plant grows naturally in the mountainous parts of Germany, from whence the roots are brought to England for medicinal purposes. The roots only are used. Lesser centaury of the shops, the *gentiana centaurium* of Linnæus, possesses an operative cleansing faculty, removes obstructions, strengthens the stomach, and destroys worms. Outwardly, it is used in fomentations against swellings and inflammations.

Gum labdanum is an odoriferous balsam or resin which is found upon a species of rock-rose, the *cistus ladanifera* of Linnæus, that grows naturally in the Levant. This substance,

ftance, which the natives collect by means of leather thongs, rubbed gently over the furface of the fhrub which produces it, is of a very balfamic nature, and ufed in medicine both internally and externally.

From a fpecies of *Hypericum*, the natives of Louifiana, we are informed by Boffu, extract an oil that proves an excellent vulnerary. The following is the Indian method of making it. In an earthen pot they put a proper quantity of the flowers, and fome bear's oil above it. The pot or vafe is then well ftopped, and expofed to the morning fun, the heat of which, concentrated in the vafe, imparts to the inclofed fubftance, which turns red, and has a very agreeable fmell, the quality of purifying and curing all forts of wounds.

S.

SAPOR, tafte. An attribute or quality in plants, depending upon an external fenfe, and, therefore, apparently different even in the fame individual, according to the ftate of the organ, which is probably affected by every change of habit in the human body.

The ancients, particularly Ariftotle, and Theophraftus, enumerate only feven primitive taftes; thefe are,

I. Sweet.
II. Fat.
III. Acid.
IV. Acrid.
V. Auftere, or harfh.
VI. Acerb.
VII. Salt, and bitter. Thefe laft are by Theophraftus confounded.

To thefe feven primitive taftes of Ariftotle and Theophraftus, Pliny has added the following fix, which, however, appear to be rather intermediate fteps of thofe already enumerated than fimple taftes.

VIII. Agreeable (*fuavis*) a mode of *fweet*.

IX. Poignant,

IX. Poignant, or tart (*acutus*) a leſs degree of *acid.*

X. Bitter (*amarus*) a ſimple taſte, confounded by the Greek naturaliſt, as was obſerved above, with a *ſalt* taſte.

XI. Vinous, a compoſition, according to Pliny, of *ſweet*, *agreeable*, *poignant*, and *auſtere*.

XII. Milky taſte, compoſed of *agreeable* and *fat*.

XIII. Watery, which is almoſt inſipid.

The ſchool of Salernum diſtinguiſhed nine ſimple taſtes, which they characterized by their different temperaments, as follows:

I. Acrid, bitter, and alkaline ſalt. WARM.

II. Watery or inſipid, ſweet, and fat. TEMPERATE.

III. Acid, harſh, or acerb, and acid ſalt. COLD.

The moderns by diſtinguiſhing auſtere from acerb, adding ſome things, and retrenching others, have increaſed the number of ſimple taſtes to ten; which ſtand thus oppoſed to each other.

I. Inſipid or watery	oppoſed to	VI. Acid, or alkaline ſalt.
II. Sweet		VII. Acrid.
III. Fat		VIII. Auſtere.
IV. Viſcous		IX. Acerb.
V. Acid		X. Bitter.

Taſtes are diſtinguiſhed by their quantum of force or intenſity into ſteps or degrees, which are likewiſe, ſometimes, by writers on the Materia Medica, uſed for expreſſing the different temperaments of thoſe taſtes. Thus the ſimple taſte bitter, has been divided into ten degrees; and we ſay, that the root of turmeric is bitter in the firſt or loweſt degree; the ſeed of blue clematis in the tenth or higheſt. In the ſame manner, as a bitter taſte indicates a warm temperament, other degrees or diviſions ariſe from the intenſity of warmth in the inſtances in queſtion: and we ſay, that one is warm in ſuch a degree, and the other in a different. Some taſtes affect the organ of ſenſation ſooner than others which are of a greater degree of intenſity. Acid and bitter taſtes, as vinegar and wormwood, are ſoon felt, and quickly gone. Acrid taſtes are not felt ſo ſoon, and laſt longer. Thus the ſharpneſs of the ſeeds of clematis, although in the tenth de-

gree, is not ſo quickly perceived, as the bitterneſs of roſes, although only in the ſecond degree. Hot taſtes are ſlower in affecting the organ of ſenſe, and laſt longer than others. Thus the bitterneſs of the roots of black hellebore, which is in the ſecond degree, is perceived on the ſlighteſt contact; but its heat, though in the third or fourth degree, is not felt till after two minutes; in like manner, the bitterneſs of elecampane, although only in the fourth degree, is ſooner felt than its heat, which is in the eighth.

The climax which is obſerved in the perception of taſtes, during its continuance, is different in different objects. The heat of galangal cauſes, at firſt, a ſlight ſenſation, but it is not till the end of one minute that its greateſt force is perceived. Black hellebore does not attain its higheſt ſenſation till four minutes after its firſt contact.

The duration of the greateſt force of the ſenſation is, likewiſe, different, as the ſubſtances differ; thus the heat of black hellebore comes to its greateſt intenſity and diminiſhes in one minute; that of the root of garden creſs in the ſame time; that of the root of aſarabacca, in two minutes.

The leaves of milfoil, which are bitter in the fourth degree, and warm in the firſt, loſe, at firſt, their bitterneſs, whilſt their heat ſtill continues. Acorus, or ſweet ruſh, is hot in the firſt degree, aromatic in the third, and bitter in the fourth; yet its bitterneſs is preſently extinguiſhed; its heat laſts two minutes, and its aromatic ſenſation ſeven or eight. The heat of garden-creſs endures ſeven or eight minutes; the bitterneſs of elaterium a quarter of an hour; the heat of euphorbium and black hellebore half an hour; the acrid ſenſation occaſioned by the root of arum, or cuckow-pint, often laſts twelve hours. From theſe familiar examples it appears, that the ſenſation acquires its greateſt force, in four or ſix minutes at moſt, from the time of contact; its duration in its decreaſe is often thirty or forty minutes and upwards.

Taſtes, conſidered with relation to the parts which they affect, are either, 1, fixed and local; 2, extend themſelves to the parts in the neighbourhood of that which is firſt affected, without,

without, however, relinquiſhing their former ſtation; as the bitterneſs of the dried roots of black hellebore, which ſpreads from the end of the tongue to its middle, and that of the leaves of elaterium, which ſpreads from the tip of the tongue to its root; or, 3, are tranſlated from one part to another, as in the roots of gentian, the bitterneſs of which ſoon relinquiſhes the tip of the tongue, the part firſt affected, and transfers itſelf to the middle.

Sapid bodies affect differently the parts which they touch, as the lips, tongue, palate, throat, and gullet.

The lips are affected more ſtrongly by the heat of the root of white hellebore, than any of the other parts.

The tip of the tongue is affected by moſt plants; gentian and coloquintida affect chiefly the middle, the leaves of elaterium, the root.

The palate is affected by the root of deadly night ſhade; its impreſſion laſts four minutes.

The throat is more affected than the other parts by the roots of mercury, aſparagus, and jalap.

The œſophagus or gullet is particularly affected with heat, by the roots of wormwood. The leaves make no impreſſion of this kind, on which account they are not ſo ſtomachic as the roots.

As the taſte of the ſame individual undergoes ſeeming alterations, according to the perfect or morbid ſtate of the external organ; ſo different individuals of the ſame ſpecies are liable to real variations from climate, ſoil and culture. Apples and pears, which grow naturally in the woods, are extremely harſh and acid; wild ſuccory is bitter; wild lettuce diſagreeable. Culture renders them all ſweet and eſculent, and moreover produces ſuch variety in the article of taſte, that of 172 diſtinct kinds of pears, and 200 of apples, enumerated by authors, each kind has a peculiar taſte.

All the parts of a plant have not the ſame taſte; in ſome, the fruit has an acid and agreeable taſte, whilſt the leaves or roots are bitter and diſagreeable; in others, the reverſe of this happens. It is for this reaſon that plants can never be properly arranged by their ſenſible qualities; the different parts

parts of the ſame plant poſſeſſing different qualities, muſt neceſſarily be disjoined and arranged under ſeparate articles.

The above obſervations on the variable nature of taſte, ſufficiently evince the neceſſity of excluding it from the liſt of genuine ſpecific differences. The following names, therefore, which are to be met with in authors, and others of the like kind, are totally to be rejected.

Apium *ingratius* (diſagreeable)

——— *dulce* (ſweet)

Lactuca *opij ſucco viroſo* (harſh like opium)

——— *mitis* (mild)

Pyrus fructu *ſaccharato* ore *deliqueſcente* (ſweet like ſugar, and melting in the mouth).

All plants act either by their ſmell upon the nerves, by their taſte upon the muſcular fibres, or by both upon the fluids. Sapid bodies never act upon the nerves, nor odoriferous bodies upon the muſcular fibres. The former act upon the fluids and ſolids, and change the fluids, which are evacuated by both ſapid and odoriferous ſubſtances.

The virtues and qualities of plants are commonly indicated by their taſte, ſmell, and colour.

Inſipid plants and ſuch as have no ſmell, have rarely any medicinal virtue.

Sapid and odoriferous plants, on the contrary, always poſſeſs very ſtrong powers. In fact, to deprive a plant of its taſte and ſmell, is to rob it of its virtue, as is evident from the change effected in the fæculæ and extracts of arum, calla, caſſada, and elaterium.

Sweet-ſmelling plants are generally of innocent quality; ſuch as are nauſeous, and of a rank, heavy, diſagreeable ſmell, are noxious.

The plants of the following liſt are ſtriking examples of the latter. Many muſhrooms, elder, herb-chriſtopher, aconite, hellebore, aſarabacca, ſtinking bean-trefoil, thorn-apple, tobacco, henbane, coloquintida, and hounds-tongue.

SARMENTACEÆ (*ſarmentum*, the twig, ſhoot, or ſpray of a vine); the name of the eleventh claſs in Linnæus's Fragments

Fragments of a Natural Method, conſiſting of plants which have climbing ſtems and branches, that, like the vine, attach themſelves to the bodies in their neighbourhood for the purpoſe of ſupport.

Liſt of the Genera *contained in this Order.*

Linnæan Genera.	*Engliſh Names.*
Alſtrœmeria.	
Ariſtolochia,	Birthwort.
Aſarum,	Aſarabacca.
Aſparagus,	Aſparagus, by corruption Sparrow-graſs.
Centella.	
Ciſſampelos.	
Convallaria,	Lily of the valley.
Cytinus.	
Dioſcorea.	
Erythronium,	Dog's tooth violet.
Glorioſa,	Superb lily.
Medeola,	Climbing African aſparagus.
Meniſpermum,	Moon-ſeed.
Paris,	True-love, or one-berry.
Rajania.	
Ruſcus,	Butcher's broom, or knee-holly.
Smilax,	Rough bind-weed.
Tamus,	Black bryony.
Trillium,	Three leaved night-ſhade, or herb true-love of Canada.
Uvularia.	

Theſe plants are far from being a true natural aſſemblage. In fact, they agree in ſcarce a ſingle circumſtance, ſave that expreſſed in the title, which is far from being peculiar to this order.

The pounded root of *ciſſampelos*, the caapeba of Plumier, applied

applied externally, is ſaid to be an antidote againſt the bites of venomous ſerpents. The plant being infuſed in water, quickly fills the liquor with a mucilaginous ſubſtance, which is as thick as jelly; whence the name of freezing-wyth, by which this genus of plants has been diſtinguiſhed by the Braſilians.

The powdered root of a Mexican ſpecies of birth-wort, the *Ariſtolochia anguicida* of Linnæus, proves, according to Dr. Jacquin, an infallible remedy againſt ſnakes; thoſe pernicious animals being actually faſcinated and even killed by it. In Carthagena, the Indians chew the root of this plant, and mix its juice with the ſaliva. If one drop of this mixture is put into the ſnake's mouth, it becomes intoxicated, and you may handle it with perfect impunity; if two or three drops are forced in, and they reach the ſtomach of the reptile, convulſions inſtantly follow, and it dies. The Indian, who ſhewed Dr. Jacquin this method, informed him likewiſe, that he himſelf had been thrice bitten by ſnakes, and had at each time cured the wound by the application both internal and external of *Ariſtolochia*. The plant itſelf has ſo nauſeous a ſmell, that it is always avoided by ſnakes, and, when chewed, cauſes vomiting even to men.

It ſeems highly probable that it is of this ſpecies of *Ariſtolochia*, that Boſſu, in his travels through Louiſiana, relates the following curious fact. " During my voyage to Tombekbé, a *whiſtler-ſnake*, (ſo termed from its having a prodigious wide mouth, and when angry, whiſtling at a terrible rate) which lay concealed under ſome leaves, bit a ſoldier of my detachment, who trod upon its tail. The ſoldier was barefoot, and the ſnake ſo irritated, that it got hold of his big toe, which it obſtinately held faſt. I was very uneaſy and ſorry to ſee this ſoldier, who was my interpreter, expoſed to periſh; and, as an Indian doctor juſt then accidentally paſſed by the place where we were, I applied to him for advice. He took a powder out of a little ſack, and blew it through a tube upon the ſnake's head, which died inſtantly. He put another powder upon the wound, which prevented the poiſon from taking effect, giving ſome of it in

water at the fame time to the patient, who was quite well in a moment. This Charlaton, continues Boffu, I recompenfed very handfomely, and wifhed to know his fecret, but in vain. He refifted every importunity to that effect, telling me haughtily, and in the true ftile and manner of the juggler, that the Mafter of life, who had communicated the art to him alone, would not permit it to be imparted to another."—Boffu, Louifiane, Tom. I.

Yams, the root of the *diofcorea bulbifera* of Linnæus, are the principal food of the Negroes in the Weft-Indies. The fkin is pretty thick, rough, unequal, covered with many ftringy fibres, and of a violet colour approaching to black. The infide is white, and of the confiftence of red beet; it refembles potatoes in its mealinefs, but is of clofer texture.

When raw, thefe roots are vifcous or clammy; when boiled or roafted, they afford very nourifhing food, and are often preferred to bread by the inhabitants of the Weft-Indies, on account of their lightnefs and facility of digeftion. The ftem of the plant is fquare: when placed by itfelf, it trails upon the ground, and ftrikes root at proper diftances; but when planted in the neighbourhood of bufhes or trees, it avails itfelf of their fupport, climbs, and in a fhort time, covers every place to which it can penetrate. The leaves are oppofite, and fhaped like a heart; they are of a dark green, pretty thick and fucculent. The flowers, which are fmall and bell-fhaped, grow in fpikes from the wings of the leaves, and are fucceeded by dry capfular fruits, each containing feveral fmall, flat, black feeds. The plant, which is a native of Africa and the Eaft-Indies, is propagated by the eyes of the root, in the fame manner as potatoes and Jerufalem artichoke. When firft dug out of the ground, the roots are placed in the fun to dry; after which, they are either put into fand, dry garrets, or cafks, where, if kept from moifture, they may be preferved whole years, without being fpoilt, or diminifhed in their goodnefs. Two or three pounds is the common weight of this root; fome yams, however, weigh twenty pounds and upwards.

In Siberia, fays Gmelin, they dry and mix with their

foups, in fpring, the root of dog's-tooth-violet, which grows in great abundance in that country, and is termed by the Siberians, befs.

The feeds of a Levant fpecies of moon-feed, being formed into a pafte, are regarded, by the inhabitants, as a genuine fpecific againft lice, and eruptions of the fkin. The fame pafte is ufed for the purpofe of intoxicating fifhes, which thus become an eafy prey to the firft invader.

SCABRIDÆ (*fcaber*, rough, rugged, briftly) the name of the fifty-third order in Linnæus's Fragments of a Natural Method, confifting of plants with rough leaves. There is an impropriety in characterizing thefe plants by a name expreffive of the roughnefs of the leaves, as that circumftance had previoufly furnifhed the claffic character of the forty-firft order, ASPERIFOLIÆ.

The degree of roughnefs, however, is much greater in the plants which make the fubject of the prefent article.

Lift of the Genera *contained in this Order.*

Linnæan Genera.			*Englifh Names.*
Acnida,			
Bofea,	—	—	Yerva-mora, or golden-rod tree.
Cannabis,	—	—	Hemp.
Cecropia.			
Celtis,	—	—	Nettle-tree.
Dorftenia,	—	—	Contrayerva.
Ficus,	—	—	Fig.
Humulus,	—	—	Hop.
Morus,	—	—	Mulberry-tree.
Parietaria,	—	—	Pellitory.
Theligonum,	—	—	Dog's-cabbage.
Ulmus,	—	—	Elm-tree
Urtica,	—	—	Nettle.

Some

Some of thefe plants, particularly fig and mulberry, yield, by incifion, a milky juice. That of the fig-tree is fo acrid and cauftic, as to make impreffions upon the fkin, which, when fuffered to remain for a fhort time, can never be effaced. *Cecropia* furnifhes an oily aftringent liquor.

Thefe plants are in general of an aftringent nature; their tafte is bitter and ftyptic.

The flefhy fruits of the mulberry, fig, and nettle-trees, and of the genus *cecropia*, are efculent.

From the leaves of hemp, pounded and boiled in water, the natives of the Eaft-Indies prepare an intoxicating liquor, of which they are very fond. From the feeds is drawn, by expreffion, an oil, which is very proper for burning. Boiled in milk till it cracks, the feed is accounted good for old coughs, and a fpecific to cure the jaundice. The œconomical ufe of hemp is well known.

The Europeans at the Cape of Good Hope fow hemp chiefly on account of the Hottentots, who fmoak the feed and the leaves as they do tobacco. This preparation likewife, to which they give the name of *Dacha*, has an inebriating quality: "nor," fays Kolben, "have the ftrongeft diftillations a more furious effect upon the head of an European than Dacha has upon the brain of a Hottentot. He raves, ftares, and capers as if poffeffed, and lofes himfelf in a million of the wildeft actions and incoherencies. They often mix *Dacha* and tobacco together, and then call it *Bufpafch*."

The fcaly fruits of hops are employed to procure an agreeable bitternefs to beer, and keep it from fouring; the young fhoots, prepared like afparagus, afford a very palatable food. From the macerated ftalks of hops might probably be obtained a fibrous fubftance, fimilar to that which is obtained from hemp.

From the fruit of nettle-tree is drawn a juice, which is faid to be aftringent, and to give eafe in violent dyfenteries. The plant has obtained the name of nettle-tree from its leaves, which are rough on the upper furface.

The root of the feveral fpecies of *dorftenia* is the true

 contrayerva

contrayerva or counterpoifon of the Spaniards. The name has been, at different times, given to many different roots, fuppofed to poffefs the virtue of refifting both internal and external poifons. With us, the root is in great eftimation in fevers that can be relieved by encreafing the difcharges through the pores of the fkin, and for throwing out the fmall pox. The root of all the fpecies is likewife ufed in dyeing.

A decoction of the old wood of a fpecies of mulberry, called tataiba by the Brafilians, dyes a fine yellow colour. The leaves of fome fpecies are the common food of filk worms.

SCAPUS, (properly the fhaft of a pillar—à σκηπτω, innitor,) an herbaceous ftem fo called, which elevates the fructification, but not the leaves: in other words, a naked ftalk, proceeding immediately from the root, and terminated by the flowers; as in narciffus, lily of the valley, hyacinth, and winter-green. This fpecies of trunk differs from a flower-ftalk, (*pedunculus*) in that the latter iffues, not from the root, but from the ftem, or branches; and from a naked ftem, (*caulis aphyllus*) in that the *fcapus*, though it elevates no leaves, has always radical or bottom leaves; whereas, a naked ftem is devoid of leaves altogether.

This fort of univerfal trunk generally prevails through all the fpecies of the fame genus, and hence, can be but feldom ufed as a difcriminating character. Two fpecies of winter-green with a triangular ftalk of this kind, are diftinguifhed by that circumftance from the other fpecies. In the *Species Plantarum*, the term *fcapus* is generally preceded by the fuperfluous word *naked*; an addition which is apt to miflead the unexperienced botanift, as feeming to imply, that nakednefs is not an effential part of the defcription of this fpecies of ftalk.

SCITAMINEÆ, (*fcitamentum, fcitum edulium*, a dainty, meat of an agreeable tafte) the name of the eighth order in Linnæus's Fragments of a Natural Method, confifting of the following beautiful exotic plants, fome of which, as

banana,

banana, furnish exquisite fruits; and others have an agreeable aromatic flavour.

List of the Genera *contained in this Order.*

Linnæan Genera.			English Names.
Alpinia.			
Amomum,	—	—	Ginger.
Canna,	—	—	Indian flowering-reed.
Costus.			
Curcuma,	—	—	Turmeric.
Kæmpferia.			
Maranta,	—	—	Indian arrow-root.
Musa,	—	—	Banana, plantain-tree.
Thalia.			

These plants are all natives of very warm countries; and, notwithstanding their great height, are only perennial by their roots.

The plants of this order which have only one filament, or male organ, (as ginger, costus, Indian flowering-reed, alpinia, and Indian arrow-root) have, in all their parts, an aromatic odour, and an acrid, or poignant taste; qualities, however, possessed in a much greater degree by the roots, which are hot, and resinous. The fruit of the different species of plantain-tree (*musa*) is acid.

The confected roots of most of the aromatics of this order are greatly in use; and their leaves, particularly those of wild ginger, and of a species of turmeric called vanhom by the Japanese, furnish excellent pot-herbs. The internal use of these plants removes obstructions, resists poison, and is of considerable efficacy in gouty and asthmatic complaints. The stalks of *costus* chewed are useful in slight stages of the venereal disease. Their leaves, applied externally, give ease in violent colics; they likewise strengthen the eyes.

The fruit of the banana-tree is of the size and shape of a middling cucumber, and of a high, grateful flavour. The leaves are two yards long, and a foot broad in the middle; they

they join to the top of the body of the tree, and frequently contain in their cavities a great quantity of water, which runs out, upon a ſmall inciſion being made into the tree, at the junction of the leaves. Bananas grow in great bunches, that weigh a dozen pounds and upwards. The body of the tree is ſo porous, as not to merit the name of wood. The tree is only perennial by its roots, and dies down to the ground every autumn.

When the natives of the Weſt-Indies, ſays Labat, undertake a voyage, they make proviſion of a paſte of banana, which, in caſe of need, ſerves them for nouriſhment and drink. For this purpoſe, they take ripe bananas, and having ſqueezed them through a fine ſieve, form the ſolid fruit into ſmall loaves, which are dried in the ſun, or in hot aſhes, after being previouſly wrapped up in the leaves of Indian flowering-reed. When they would make uſe of this paſte, they diſſolve it in water, which is very eaſily done, and the liquor, thereby rendered thick, has an agreeable acid taſte imparted to it, which makes it both refreſhing and nouriſhing.

The banana is greatly eſteemed and even venerated by the natives of Madeira, who term it the forbidden fruit, and reckon it a crime almoſt inexpiable to cut it with a knife; becauſe, after diſſection, it exhibits, as they pretend, a ſimilitude of our Saviour's crucifixion; and to cut the fruit open with a knife, is, in their apprehenſion, to wound his ſacred image.

Some authors have imagined, that the banana-tree was that of the leaves of which our firſt parents made themſelves aprons in Paradiſe. The ſacred text, indeed, calls the leaves employed for that purpoſe, fig-leaves; and Milton, in a moſt beautiful, but erroneous deſcription, ſuppoſes the Malabar, or Decan fig, to have been the tree alluded to. But, beſides that the fruit of the banana is often, by the moſt ancient authors, called a fig, its leaves, by reaſon of their great ſize and ſolidity, were much better adapted for a covering, than thoſe of the fig-tree juſt mentioned, which are ſeldom above ſix or eight inches long, and three broad.

On

On the other hand, the banana leaves being three, four and five feet long, and proportionably broad, could not fail to be pitched upon, in preference to all others; eſpecially as they might be eaſily connected, by means of the numerous ſtringy filaments that may be peeled with the utmoſt facility from the body of this tree.

Indian arrow-root is the only remedy yet known againſt wounds made by arrows poiſoned with the milky juice of the manchineel-tree. The natives of the Caribbee Iſlands, where it naturally grows, call it *toulola*. It reſembles Indian flowering-reed, except in its height, which ſeldom exceeds four feet. The flower is white, and ſucceeded by a fruit with three ſides like a priſm, of a pale red, and very ſleek, containing a ſmall, wrinkled, or furrowed ſeed. The root is a long, white, jointed, watery, and mealy bulb, from which hang a great number of long dry fibres. The leaves are ſtrong, almoſt as firm as parchment, of a light green, curl themſelves as ſoon as gathered, and are attached to the trunk by a long furrowed ſtalk; they are round below, four times longer than broad, and end in a point, like the extremity of a ſpear or halberd. The root is pounded, infuſed in water, and made into ptiſan, which is drunk by thoſe who have been wounded with poiſoned arrows. It has the virtue of diſſipating the *virus*, and of preventing it from reaching the noble parts. The ſame root bruiſed, and made into a cataplaſm, is applied externally to the wound, and with great efficacy, if quickly uſed; but if delayed, though for a very ſhort time, the poiſon gains ground, corrupts the parts adjoining to the wound, and having communicated its virulence to the larger veſſels, proves mortal. Of the root of this plant is likewiſe made an exceeding fine ſtarch, far ſurpaſſing that made with wheat.

SECTIO. *Vide* ORDO.

SEMEN, the ſeed; the eſſence of the fruit of every vegetable; defined by Linnæus to be a deciduous part of the plant, containing the rudiments of a new vegetable, and fertilized by the ſprinkling of the male duſt. The parts of a

ſeed

ſeed properly ſo called enumerated by Linnæus, are as follows:

I. CORCULUM, the *punctum vitæ*, or eſſence of the ſeed.

II. COTYLEDONES, the lobes.

III. HILUM, a mark or ſcar in the ſeed.

IV. ARILLUS, Lin. the proper covering: *calyptra* of Tournefort.

V. CORONULA, PAPPUS, } the crown of the ſeed.

VI. ALA, the wing of the ſeed.

Each of theſe terms is particularly explained under its proper head.

Beſides the ſeed properly ſo called, two other terms are referred by Linnæus to the general article of SEMEN: theſe are,

VII. NUX, a nut, or ſeed covered with a hard bony ſkin.

VIII. PROPAGO, the ſeed of the moſſes.

With reſpect to number, plants are either furniſhed with one ſeed, as ſea-pink, and biſtort; two, as wood-roof, and the umbelliferous plants; three, as ſpurge; four, as the lipped flowers of Tournefort, and rough-leaved plants of Ray; or many, as ranunculus, anemone, and poppy.

The form of ſeeds is likewiſe extremely various, being either large or ſmall, round, oval, heart-ſhaped, kidney-ſhaped, angular, prickly, rough, hairy, wrinkled, ſleek, or ſhining, black, white, or brown. Moſt ſeeds have only one cell, or internal cavity; thoſe of leſſer burdock, valerian, lamb's lettuce, cornelian-cherry, and ſebeſten, have two.

With reſpect to ſubſtance, ſeeds are either ſoft, membranaceous, or of a hard bony ſubſtance. This laſt is exemplified in gromwell, tamarind, and all the nuciferous plants.

In point of magnitude, ſeeds are either very large, as in cocoa-nut; or very ſmall, as in campanula, *ammannia*, rampions, and throat-wort.

With reſpect to ſituation, they are either diſperſed promiſcuouſly through the pulp, *(ſemina nidulantia)* as in water-lily; affixed

affixed to a future, or joining of the valves of the seed-vessel, as in the cross-shaped and pea-bloom flowers; or placed upon a *placenta* or receptacle within the seed-vessel, as in tobacco, and thorn-apple.

Seeds are said to be naked (*semina nuda*) which are not contained in a vessel: such are those of the lipped and compound flowers, the umbelliferous and rough-leaved plants. Covered seeds, (*semina tecta*) are contained in some vessel, whether of the capsule, pod, berry, apple, or cherry kind.

A simple seed is such as bears neither crown, wing, nor downy *pappus*. The varieties in seeds, arising from these circumstances, are particularly enumerated under their respective heads.

In assimilating the animal and vegetable kingdoms, Linnæus denominates seeds, the eggs of plants. The fecundity of plants is frequently marvellous. From a single plant, or stalk of Indian Turky wheat, are produced, in one summer, 2000 seeds; of elecampane, 3000; of sun-flower, 4000; of poppy, 32,000; of a spike of cat's-tail, 10,000 and upwards: a single fruit, or seed-vessel of tobacco, contains 1000 seeds; that of white poppy, 8000. Mr. Ray relates, from experiments made by himself, that 1012 tobacco seeds are equal in weight to one grain; and that the weight of the whole quantum of seeds in a single tobacco plant, is such as must, according to the above proportion, determine their number to be 360,000. The same author estimates the annual produce of a single stalk of spleenwort, to be upwards of one million of seeds.

The dissemination of plants respects the different methods, or vehicles, by which Nature has contrived to disperse their seeds for the purpose of increase. These by naturalists are generally reckoned four.

I. Rivers, and running waters.

II. The wind.

III. Animals.

IV. An elastic spring peculiar to the seeds themselves.

I. The seeds which are carried along by rivers and torrents,

rents, are frequently conveyed many hundreds of leagues from their native ſoil, and caſt upon a very different climate, to which, however, by degrees, they render themſelves familiar.

II. Thoſe which are carried by the wind, are either winged, as in fir-tree, trumpet-flower, tulip-tree, birch, arbor vitæ, meadow rue, red jeſſamine, and ſome umbelliferous plants; furniſhed with a *pappus*, or downy crown, as in valerian, poplar, reed, ſucculent ſwallow-wort, cotton-tree, and many of the compound flowers; placed within a winged calyx, or ſeed-veſſel, as in ſcabious, ſea pink, dock, *dioſcorea*, aſh, maple, and elm-trees, log-wood and woad; or, laſtly, contained within a ſwelled calyx, or ſeed-veſſel, as in winter-cherry, cucubalus, melilot, bladder-nut, fumatory, bladder-ſenna, heart-ſeed, and chich-peaſe.

III. Many birds ſwallow the ſeeds of vanelloe, juniper, miſtletoe, oats, millet, and other graſſes, and void them entire. Squirrels, rats, parrots, and other animals, ſuffer many of the ſeeds which they devour, to eſcape, and thus in effect diſſeminate them. Moles, ants, earth-worms, and other inſects, by ploughing up the earth, admit a free paſſage to thoſe ſeeds which have been ſcattered upon its ſurface.

Again, ſome ſeeds attach themſelves to animals, by means of hooks, crotchets, or hairs, which are either affixed to the ſeeds themſelves, as in hound's-tongue, mouſe-ear, vervain, carrot, baſtard parſley, ſanicle, water hemp-agrimony, *arctopus*, and *verbeſina*; to their calyx, as in burdock, agrimony, *rhexia*, ſmall wild bugloſs, dock, nettle, pellitory, and lead-wort: or to their fruit, or ſeed-veſſel, as in liquorice, enchanter's night-ſhade, croſs-wort, cleavers, French honey-ſuckle, and arrow headed graſs.

IV. The ſeeds, which diſperſe themſelves by an elaſtic force, have that force reſident either in their calyx, as in oats, and the greater number of ferns; in their *pappus*, as in *centaurea crupina*; or in their capſule, as in geranium, herb-bennet, African ſpiræa, fraxinella, horſe-tail, balſam, Malabar nut, cucumber, elaterium, and male balſam-apple.

SEMIFLOSCULOSI, the name of the thirteenth claſs in Tournefort's Method, conſiſting of compound flowers with plain or tongue ſhaped florets. The term is exemplified in dandelion, nipplewort, and ſuccory.

SEMIFLOSCULOSUS *flos*. *Vide* LIGULATUS *flos*.

SENTICOSÆ, (*ſentis*, a briar, or bramble) the name of the thirty-fifth order in Linnæus's Fragments of a Natural Method, conſiſting of roſe, bramble, and other plants which reſemble them in port, and external ſtructure.

Liſt of the Genera *contained in this Order*.

Linnæan Genera.			English Names.
Agrimonia,	—	—	Agrimony.
Alchemilla,	—	—	Ladies mantle.
Aphanes,	—	—	Percepier.
Comarum,	—	—	Marſh cinquefoil.
Dryas.			
Fragaria,	—	—	Strawberry.
Geum,	—	—	Avens, or herb-bennet.
Potentilla,	—	—	Cinquefoil.
Roſa,	—	—	Roſe.
Rubus,	—	—	Raſpberry, bramble.
Sibbaldia.			
Tormentilla,	—	—	Tormentil.

Theſe plants are ſo nearly allied in form, habit, and ſtructure to thoſe of the natural order, *pomaceæ*, that they ought never to have been ſeparated from it. As we wiſh not, therefore, uſeleſsly to enlarge the work by unneceſſary repetitions, the reader is referred for a general deſcription of the plants of the order *ſenticoſæ*, with very few exceptions, to the article alluded to.

The leaves of theſe plants have a ſtyptic taſte. The fruits are acid and cooling. The roots of herb-bennet ſmell like cloves, whence the name of *caryophyllata*, by which that genus of plants was known in the time of Pliny.

With reſpect to their virtues, the leaves are vulnerary and aſtringent,

aſtringent, the roots diuretic. The ſubacid fruits, as ſtrawberry, and raſpberry, are uſed with ſucceſs in putrid and bilious fevers, as likewiſe in contagious and epidemical dyſenteries, which prevail in ſummer and autumn, and are occaſioned by a ſudden tranſition from a hot to a cold air, or by the acrid nature of the humours which flow into the inteſtines.

The inhabitants of the eaſtern countries ſprinkle the water, which is diſtilled from white roſes, on the hands, face, head, and cloaths of the gueſts whom they mean to honour, and afterwards perfume them with frankincenſe and wood of aloes.

SEPIARIÆ (*ſepes*, a hedge) the name of the forty-fourth order in Linnæus's Fragments of a Natural Method, conſiſting of the following beautiful collection of woody plants, ſome of which, from their ſize, elegance, and other circumſtances, ſeem very proper furniture for hedges.

Linnæan Genera.			*Engliſh Names.*
Chionanthus,	—	—	Snow-drop tree, or fringe-tree.
Fraxinus,	—	—	Aſh-tree.
Jaſminum,	—	—	Jeſſamine, or Jaſmine.
Liguſtrum,	—	—	Privet.
Nyctanthes,	—	—	Arabian jaſmine.
Olea,	—	—	Olive.
Phillyrea,	—	—	Mock-privet.
Syringa,	—	—	Lilac.

This order furniſhes woody plants both of the ſhrub and tree kind, moſt of which do not drop their leaves till nearly the time in which the new leaves begin to appear.

The flowers of jeſſamine, which is a native of the Indies, have a very agreeable ſmell; they are cordial, cephalic, anodyne, and frequently enter as an ingredient into the compoſition of perfumes and odoriferous oils.

The leaves of privet have a bitter acrid taſte; the flowers have a ſtrong diſagreeable ſmell: the former are aſtringent; the latter deterſive.

The

The. Banian Indians, who are much addicted to ſweet ſmells and fragrant exhalations, generally wear a necklace of the flowers of Arabian Jeſſamine in the night-time; as it is then that they moſt ſenſibly emit their odoriferous vapours.

The flowers of a ſpecies of Arabian jeſſamine open in the evening, and drop off in the morning; whence the name of *arbor triſtis*, or the ſorrowful tree, by which Linnæus has diſtinguiſhed it.

The roots of many of the plants of this order, particularly of Arabian jeſſamine, preſerve from the dreadful conſequences of the venomous bites of ſerpents, ſcorpions, and mad dogs.

The bark of olive tree has a bitter taſte; the fruits, freſh as gathered, are acrid, ſtomachic, and heating; the oil obtained from the fruit is emollient and laxative; the leaves are aſtringent.

From a ſpecies of aſh, the *fraxinus rotundiore folio* of Caſpar Bauhin, the *fraxinus ornus* of Linnæus, which grows plentifully in Calabria and other parts of Italy, flows naturally, and by inciſion, a ſweet juice, which, when condenſated, is known by the name of Calabrian manna, and is eſteemed an excellent cathartic for children, and ſuch as are of weak conſtitutions.

SEXUS *plantarum*. The doctrine of the ſexes of plants.

As it is of the utmoſt importance for ſtudents in botany to have preciſe and clear ideas upon this ſubject, I purpoſe to handle it at ſome length; and, that the queſtion may be fairly and impartially ſtated, ſhall, in the firſt place, trace the hiſtory of the doctrine of the ſexes, from its earlieſt appearance in botanical writings to its more improved ſtate under the celebrated Linnæus, whoſe ſyſtem claims it as its ſole principle; ſecondly, enumerate and illuſtrate the ſeveral arguments in ſupport of the ſexes of plants; and, thirdly, examine the force and weight of the objections which are adduced to diſprove the theory.

I. Theophraſtus, the Father of Botany, frequently mentions the ſexes of plants. He obſerves, that trees may be diſtinguiſhed into ſeveral claſſes, on account of their great

variety, but that their most common distinction is into Male and Famale, the one of which is fertile, the other, in some sorts, barren. This distinction of the sexes, however, is not so much founded upon an analogy betwixt vegetables and animals, as upon the greater or less perfection of the fruit in the plants in question. In a species of palm-tree, mentioned by this author and Aristotle, the analogy in question is more strictly preserved. "If the dust of a branch of the male palm, says Aristotle, is shaken over the female, the fruit of the latter will quickly ripen; nay," continues the same author, "if this male dust shall be carried along by the wind, and dispersed upon the female, the same effect will follow, as if a branch of the male had been suspended over it." To the same purpose, Theophrastus observes, that unless the dust or down of the male palm is sprinkled *over* the fruit of the female, it will never ripen, but fall off. That these naturalists, however, were not clear in opinion that the fruit so sprinkled with the male dust was impregnated by it in the same manner as the ovary is fecundated in animals, appears from another passage in the last quoted author, in which he asserts, that though the fact just mentioned cannot be denied, yet no reason whatever can be assigned for the effect of the sprinkling.

Dioscorides, the next Greek botanist of note after Theophrastus, denominates many plants male and female, but without regard to analogy, or to their fertility, or barrenness. Thus his male mercury carries the seed, and the female is barren. These ideas of the sexes of plants have been transferred to our own times; and, it is not uncommon to hear peasants confounding the sexes of hemp, spinach, and hop, by calling the male plant female, and the female plant, or that which bears the seeds, male.

Aristotle, as well as Dioscorides, errs widely in his manner of distinguishing the male from the female plant; the former of which, in his opinion, is larger and stronger; the female weaker, but more fruitful.

"Naturalists," says Pliny, "admit the distinction of sex, not only in trees, but in herbs, and all plants." "Yet," continues

continues the fame author, "this is no where more obfervable than in palms, the females of which never propagate but when they are fecundated by the duft of the male."

Upon the whole, I cannot help agreeing with Dr. Alfton, that the palm-tree is the only inftance among the ancients, where fexes are attributed to particular plants, on account of fertility, or barrennefs. Cæfalpinus was the firft who corrected the miftakes of the ancients with refpect to the fex of plants, and eftablifhed orthodox opinions on that fubject. He obferved, that in fome trees, as yew, and in fome herbaceous vegetables, as mercury, hemp, and nettle, the fruit was produced on one root, and flowers only on the other. The laft being barren, was denominated the male plant; the other being fertile, the female. The female plants, continues the fame intelligent author, fucceed better, that is, become more fruitful, if fowed in the neighbourhood of the male: certain exhalations from the latter difperfing themfelves over their furface, and, by an operation not to be explained, difpofing them to produce riper and more perfect feeds.

Cæfalpinus's idea of fex in plants was reftricted to a very inconfiderable number; thofe, to wit, in which the fuppofed organs are placed apart from each other, on feparate roots produced from the fame feed. In plants of this defcription, their analogy to animals would, in a manner, fuggeft itfelf. From the fame feed are produced two different plants, the one barren, the other fertile. The analogy to the fexes of animals, immediately prefents itfelf to the mind, and we denominate that which is barren, or bears no feeds, male; that which is fertile, or bears feeds, female. The fame analogy carries us further, and induces a conjecture, that thefe male and female plants are connected together in fuch a manner, that the fecundation of the feeds of the female is produced, as in animals, by the male. This conjecture, furnifhed by analogy, leads to obfervations and experiments for its fupport: and thus the doctrine of the fexes, fmall and inconfiderable in its beginnings, becomes enlarged, and, from being con-

fined to a very ſmall number of plants, extends itſelf over the whole vegetable kingdom.

It was Dr. Nehemiah Grew who, in 1682, in conjunction with the learned Sir Thomas Millington, firſt ſuggeſted the univerſality of ſexes in plants, and the primary uſe of the *antheræ*, *apices*, or tops of the *ſtamina*, in impregnating the ſeed. Theſe tops, he obſerves, are chiefly uſeful to the plant itſelf, becauſe all plants, even ſuch as want the foliature or petals, are provided with them; he then plainly aſſerts, as his opinion, that when the tops, which he calls the attire, break or open, their incloſed *pollen* or duſt falls down on the ſeed-bud, the vegetable *uterus*, and endues it with a prolific virtue; not, as he explains himſelf, by entering into it bodily, as the *ſemen maſculinum* in animals, but by communicating to it ſome ſubtle and vivific effluvia.

This opinion of Grew was adopted by ſeveral ſucceeding botaniſts, particularly Ray, Camerarius, Geoffroy, Samuel Morland, Blair, Juſſieu, Bradley, Van Royen, Malpighi, Vaillant, Ludwig, Wolfius, Logan, Monro, and the juſtly celebrated Linnæus.

Ray, at firſt, mentions Grew's doctrine only as probable, but afterwards declares his full aſſent to it, and collects the arguments that are uſed to ſupport it.

Rudolphus Jacobus Camerarius, about the end of the 17th century, endeavoured to demonſtrate the analogy betwixt the generation of plants and animals. Among other arguments for the ſex of plants, he makes uſe of the following: "that copulation," ſays he, "is neceſſary in the generation of animals is paſt a doubt: that a ſimilar junction obtains in that of plants appears from this circumſtance, that if either the tops, (*antheræ*) of the male, or the ſtyles of the female, or both, are wanting, no fecundation, and conſequently no generation, can take place." This aſſertion he exemplifies in the mulberry-tree, mays, and mercury, in which the *ſtamina* of the male flowers being either plucked off before they had attained maturity, as in the two firſt inſtances, or placed at a diſtance from the female plant, as in the

the laſt, the buds that ought to have produced fruit came not to maturity. The ſame author ſpeaks of the number of *ſtamina* in flowers; ſo that in his works we may recognize almoſt the firſt principles of the renowned Sexual Syſtem of Linnæus. Camerarius's objections to his own doctrine are referred to the third head of this article.

I ſhould have obſerved, that, almoſt a century before Grew, Zaluzianſki, a native of Poland, had clearly diſtinguiſhed the ſexes of plants, and pointed out the difference betwixt male, female, androgynous, and hermaphrodite plants. Grew's improvements on the idea of Cæſalpinus and Zaluzianſki have made him generally be conſidered as the author of the doctrine alluded to. Certain it is that he has handled the ſubject with great accuracy, and endeavoured, by repeated microſcopical examinations, to throw light upon this obſcure, but curious enquiry.

Signior Malpighi, who was contemporary with Grew, likewiſe examined by the microſcope the male or fecundating duſt, the ſtyles of the ſeed-bud, and the manner in which the *anthers* open or burſt when ripe.

Morland, Geoffroy, and Vaillant, who have written ſucceſſively upon this ſubject, all concur in aſſerting that the duſt of the *anthers* or tops of the *ſtamina*, is entirely analogous to the *ſemen maſculinum* of animals, and abſolutely neceſſary for fecundating the ſeed. Morland, however, differs from Grew, in his conception of the manner in which the fecundation in queſtion is accompliſhed. The latter, as we have ſeen, gave it for his opinion, that the fecundating duſt did not enter bodily into the ovary of the plant, but operated it's effect by means of ſome ſpirituous emanations, or vivifying effluvia. Morland, on the other hand, aſſerted that "the male duſt is a congeries of ſeminal plants, one of which muſt be conveyed through the ſtyle into every *ovum* or ſeed before it can become prolific." This hypotheſis, as the reader will eaſily perceive, is analogous to that of animal generation by means of *animalculæ* in *ſemine maſculino*. Geoffroy, in a memoir preſented to the Academy of Sciences at Paris in 1711 on the

the ſtructure and uſe of the principal parts of flowers, aſſerts, that the germ, or *punctum vitæ*, is never to be ſeen in the ſeed, till the *anthers* have ſhed their duſt: and that if the *ſtamina* be cut out before the *anthers* open, the ſeed will either not ripen, or be barren if it ripens. This laſt is Camerarius's great argument repeated; a further illuſtration of it will be given below.

In 1717 M. Vaillant made ſome very ingenious diſcoveries with reſpect to the nature of the fecundating duſt, and the manner of its exploſion. He ſeems, ſays an ingenious French author, to have been the firſt eye-witneſs of this ſecret of Nature, this admirable ſport that paſſes in the flowers of plants between the organs of different ſexes. Vaillant is entirely of Grew's opinion, that it is the volatile ſpirit of the male duſt, not its groſs or bodily ſubſtance that enters the ſeeds of plants: the ſtyle, which leads to the caſe containing the ſeeds, being frequently found perfectly ſolid and impenetrable by that ſubſtance.

Laſtly, the illuſtrious Sir Charles Linné has completed the doctrine of the ſex of plants, by collecting all the arguments in ſupport of it that can poſſibly be advanced, and by founding upon it a ſyſtem, in which all vegetables are arranged under particular claſſes, diſtinguiſhed by the number and other circumſtances of their *ſtamina*, or male organs.

II. We come now to take a particular view of the arguments in ſupport of the ſex of plants, ſome of which have been juſt hinted at in the foregoing part of this article. Theſe arguments ariſe either from a general view of the ſtructure, proportion, and ſituation of the ſuppoſed organs of generation, or from experiments on thoſe organs. The firſt ſet of arguments has been already fully handled under the article ANTHERA. Before I proceed to the other, I would beg leave to remind the reader, that the point in diſpute is, whether the *pollen*, or duſt of the tops of the *ſtamina*, is abſolutely neceſſary for fertilizing the ſeeds; or, whether, on the contrary, good and perfect ſeeds may not be produced, when the pretended fecundating duſt is denied acceſs to the caſe or

vessel that contains them. The sexualists maintain the former proposition; the anti-sexualists the latter.

Arguments for the Sex of Plants derived from Experiments on the pretended Organs.

1. The leading argument for the sexes is, that derived from the castration or mutilation of the flowers. This is effected by cutting off the tops of the *stamina* before they have attained maturity, and dispersed the dust contained within their substance. "If," says Wahlbom, "the *anthers* of any plant which bears only one flower are cut off, and care taken to prevent the access of any other plant of the same species, the fruit proves abortive." This observation Linnæus particularly applies to the tulip, which, in the circumstances just mentioned, he affirms to be always productive of imperfect seeds. In like manner, we are taught to believe, that, by removing all the flowers of a melon plant that are furnished with *stamina*, we render the fruit abortive; and that such abortion is occasioned, not by the loss of juice which the plant has sustained from castration, but by the inability of the fruit to mature its seeds, without the assistance of the dust of the *stamina*. Were castration in flowers to be always attended with the effect just mentioned, I should not hesitate to pronounce, notwithstanding some plausible arguments, that even then might be urged against it, that the doctrine of the sex of plants was established beyond a doubt. The fact, however, is, that the experiment in question has been performed upon very few plants, and, in many instances, has not been attended with the desired success.

2. Another argument for the sexes arises from the sterility of plants in which, from excess of nourishment, the *stamina* are totally excluded, and degenerate into petals. Of this kind are all full flowers, the seeds of which never ripen. Luxuriance of nourishment has a similar effect on animals in destroying their generative faculties.

3. If

3. If, when the tops of the *ſtamina* are cut off, the duſt of a flower of a different ſpecies is ſhaken over the *ſtigma*, or pretended female organ, the ſeeds ripen, and produce plants, which partake of the nature of both the fecundating and fecundated ſpecies. Such plants too reſemble mules in the animal kingdom, and neither generate nor perfect ſeeds.

4. Another argument for the ſexes ariſes from experiments on plants in which the *ſtamina* are produced on one root, and the ſeeds on another. Caſtration, we have ſeen, ſucceeds only in plants which have the *ſtamina* either incloſed within the ſame covers, or placed upon a different part of the ſame plant with the ſeeds. In plants that have the ſuppoſed male and female organs placed upon diſtinct roots obtained from the ſame ſeed, the ſexualiſts pretend, that the impregnation in queſtion is accompliſhed, as in other plants, by the duſt of the *anthers*, which is conveyed by the wind, or ſome other means, and ſhed over the *ſtigma* of the female plant: ſuch plants being, for this purpoſe, as they affirm, generally found in the neighbourhood of one another. Linnæus aſſerts, that a female plant of the roſe-root, which grew in the Botanical Garden at Upſal, was barren from 1702 to 1750, when a male plant being brought, it produced ripe and perfect ſeeds. The ſame author relates, that the genus *clutia* which had been barren in moſt of the gardens in Holland, being found to ripen ſeeds at Leyden, he concluded that a male plant of that ſpecies was in the neighbourhood, which, upon ſtrict ſearch being made for that purpoſe, was found in reality to be the caſe.

5. The culture of palm-trees, as related both by ancient and modern authors, has furniſhed a ſtriking argument for the ſex of plants.

We have already mentioned the teſtimonies of Theophraſtus, Pliny, and Ariſtotle, on this ſubject, who ſeem, however, to ſpeak from the relations of others, more than from their own proper knowledge and experience. Kæmpfer, Proſper Alpinus, Father Labat, Dr. Haſſelquiſt, and other modern writers, have joined their teſtimonies to thoſe delivered

delivered by the ancients, and agree in afferting, that though the date-bearing palm may produce good dates, without the affiftance of the flowering or male palm, yet, that the date-ftones, which are the feed of the plant in queftion, will not grow.

The two laft authors having been eye-witneffes of the culture they defcribe, deferve particular attention. "I had the pleafure, (fays Dr. Haffelquift, in his journey to Damietta) of feeing one of the moft remarkable fights in nature. A date-bearing, or female palm, had put forth its bloffoms from the fpatha. I went to fee it, and found a gardener, the proprietor, climbing up the tree, which equalled our largeft firs in height; *he had a bunch of male flowers, with which he powdered the female, and thus rendered them fertile.*" Again, in a letter to Dr. Linnæus, dated from Alexandria—" The firft thing I did after my arrival in Egypt, was to fee the date-tree, the ornament, and a great part of the riches of this country. It had already bloffomed, but I had, neverthelefs, the pleafure of feeing in what manner the Arabs affift its fecundation, which is as follows. When the *fpadix*, or receptacle of the palm bears female flowers, they fearch on a male palm for a *fpadix* which has not yet burft, or been protruded from its fheath (fpatha): this they open, take out the *fpadix* and cut it lengthwife in feveral pieces, taking care not to hurt the flowers. A piece of this *fpadix* with male flowers is put lengthways between the fmall branches of the *fpadix* with female flowers, over which is laid a palm-leaf. In this fituation, continues the doctor, I yet faw the greateft part of the *fpadices* or heads of flowers which bore their young fruit; but the male flowers, which were intermingled with the female, were withered. The Arab, who informed me of thefe particulars, gave me likewife the following anecdotes. Firft, unlefs they wed, and fecundate the date-tree in this manner, it bears no fruit. Secondly, they always take the precaution to preferve fome unopened *fpathæ* with male flowers, from one year to another, to be applied for this purpofe, in cafe the male flowers fhould mifcarry, or fuffer damage.

Thirdly,

Thirdly, *if they permit the ſpadix of the male flowers to burſt or come out, it becomes uſeleſs for fecundation: they muſt have its* VIRGIN-HONOURS, (theſe were the words of the Arab) which are loſt in the ſame moment the bloſſoms burſt out of their caſe. The perſon, therefore, who cultivates date-trees, *muſt be careful to hit the proper time of aſſiſting their fecundation, which is almoſt the only article in their cultivation.*" *Vide* Dr. Haſſelquiſt's Travels in the Levant, p. 112 and 416.

Father Labat's teſtimony reſpecting the fecundation of the female palm by the male, deſerves credit the rather, as this author profeſſes himſelf diſſatisfied with the doctrine in queſtion. His words are theſe. "It is pretended that the date-tree is male and female; that the male flowers, but bears no fruit, that taſk being left to the female, which likewiſe proves barren, unleſs it be ſituated in the neighbourhood, or at leaſt within ſight, of the male. I am ſorry, continues that Reverend Father, that I cannot ſubſcribe to this opinion of the naturaliſts, being prevented by a certain fact, conſiſting with my own knowledge, which is directly contradictory to that opinion. Near our monaſtery in Martinico is a date-tree which bears fruit, though ſingle; whether it is male or female I know not, but of this I am certain, that for more than two leagues round, there was not then, nor, as I am informed, ever had been any tree of the ſame kind; whence we may, I think, reaſonably conclude, that the preſence of the male is not ſo neceſſary for the purpoſe of fecundation as naturaliſts pretend. It may indeed be ſaid, that this tree, in default of a male of its own ſpecies, availed itſelf, like certain animals on the coaſt of Africa, of the prolific virtue of any male in its neighbourhood, whether allied to it or not. In fact, there are ſome cocoa-trees in the neighbourhood of our date-tree, which, in all probability, might have performed the function of the male palm, and rendered our female fruitful." *Vide* Nouveau Voyage aux Iſles de l'Amerique, tom. 3, chap. 2.

Of this conceſſion of the Reverend Father, I do not mean to avail myſelf; becauſe, I ſhall ſoon convince the reader,

from

from that author's own words, that no fecundation, of whatever kind, had taken place in the inſtance in queſtion. For, continues Labat, "*the ſtones of the iſland date-trees will not riſe*; ſo that thoſe who would raiſe palm-trees, are obliged to plant the Barbary date-ſtones, which have the germ or *punctum vitæ* neceſſary for the production of a new plant. Thus we ſee, hens lay eggs without the aſſiſtance of the cock; but theſe eggs cannot be hatched, or produce chickens, becauſe they have not the *germ*, or *punctum vitæ*, which is communicated only by the male." This illuſtration is exceedingly apt, and is indeed the very example I ſhould myſelf have recurred to. It is evident then, that though in the inſtance juſt given, the date, that is, the ſeed-veſſel, attained maturity; yet the ſtones, that is, the ſeeds, however ſeemingly ripe, were barren, and upon trial, found totally incapable of producing their like. M. Labat's miſtake conſiſts in a miſapprehenſion of the term fruit; which is never to be underſtood of the veſſel, or caſe containing the ſeeds, but of the ſeeds themſelves. In the former ſenſe, the fruit may often attain maturity, and yet the ſeeds prove barren. This is what happened to the date-tree of Father Labat; it is what happens in many figs, the fruit of which, in the vulgar acceptation of that word, is merely the common calyx of a number of female flowers that line its internal ſurface.

With reſpect to that part of Dr. Haſſelquiſt's relation, which affirms, that the date-tree, unleſs fecundated by the male, bears no fruit, we are to underſtand the term fruit in its genuine acceptation, of ripe and perfect ſeeds. For that date-trees which prove barren never bear dates, is contradicted by the concurring teſtimony of all the writers on this ſubject. That the dates are greatly meliorated in point of richneſs and taſte, by the aſſiſtance of the male, and that, when ſolitary and barren, they are frequently apt to fall off, before they have attained perfect maturity, are facts which cannot be diſputed; yet their barrenneſs does not hinder them from becoming ſoft, yellow, luſcious; in a word, of ſhewing every indication of perfect ripeneſs, excepting that they retain a

ſlight degree of ſharpneſs, which poſſibly might be removed by fecundation.

6. Another argument for the ſexes, is derived from the curious huſbandry of fig-trees, as practiſed to this day in the Levant, and known by the name of caprification.

An ample deſcription of this mode of culture is given under the article CAPRIFICATIO, whither we refer the reader.

7. If the ſtigma, or top of the pointal, is cut off; if its moiſture is abſorbed by continued ſmoke, or long tracts of rain; if ſudden froſts hinder the anthers from opening, or violent rains dilute and carry off their duſt: in all, or any of theſe caſes, no fecundation, ſay the ſexualiſts, will enſue, and the fruit is diminiſhed, both in point of quantity and quality. Abortions of this kind are frequently obſerved in the cherry, almond, peach, plum, apricot, apple, and pear trees, vines, barley, oats, rye, and wheat, when there are long uninterrupted tracts of rain at the time of their flowering. If, on the contrary, the air is dry and ſerene during that ſeaſon, the crop is both excellent and abundant.

"Moſt flowers, ſays Wahlbom, expand themſelves during the influence of a burning ſun, but cloſe at night and in moiſt weather, leſt the water ſhould dilute, and waſh off the powder of the ſtamina, and thus prevent it from impregnating the ſeeds; but that operation once effected, the flowers no longer contract as formerly at nights, nor during the continuance of heavy rains." He adds, "that rye, wheat, many graſſes and plantains, thruſt out their *anthers* when in flower, on pretty long ſtamina, and thus expoſe the incloſed powder to be waſhed away by the rains. The conſequence is, that the florets ſo caſtrated prove abortive; and this abortion taking place in any of the eſculent graſſes, creates a ſcarcity.

Laſtly, another argument for the ſexes, is derived from the diſpoſition of ſome aquatic plants to flower only above the water. "The contrivance of Nature," ſays Geſner, "is truly admirable in the flowers of aquatic plants which are furniſhed with the fecundating duſt. At the time of flowering,

flowering,—the flowers being specifically lighter than the water, are carried above its surface, that the fecundation may be performed in the air, and the generating substance may not be diluted by the water."

Water-lily, marsh-aloe, *vallisneria*, pond-weed, and frog's bit, furnish familiar examples of the circumstance alluded to. There are, however, several plants, particularly triple-headed pond-weed, *ruppia*, *isoetes*, duck meat, wrack or sea-weed, and ceratophyllum, which flower under the water, either because the dust of the *stamina*, and the moisture of the *stigma*, are of such a nature as not to be affected or altered by it; or, that the former acts only by a subtle vapour, analogous to the atmosphere of electrical bodies.

III. The arguments against the sexes of plants, which come now to be considered, are collected by the ingenious Professor Alston, in his Tyrocinium Botanicum, and in a Dissertation on the Sexes of Plants, to be found in the first volume of the Edinburgh Physical and Literary Essays. The Doctor's method is to state, from different authors, the several facts that are adduced in support of the doctrine; and then to refute it by another set of facts directly contradictory in their nature to the former. In prosecuting this method, he is frequently betrayed into an acrimony of expression little suited to the gravity and dignity of a philosophical discussion. He terms the refined and ingenious Sexual System of Linnæus a *hideous superstructure*; and his analogies between plants and animals *fulsome and obscene*; and though he is at every turn complimenting him with "the justly celebrated Linnæus, the prince of modern botanists," and such like epithets; yet he scruples not to assert, that he has done much more prejudice than good to science, and that, in fine, his method in botany is worse than no method at all. With these abatements, the Dissertation on the Sexes is a sensible and spirited performance; and, whilst it discovers the author superior to vulgar prejudices and errors, displays a laudable aversion to new hypotheses in philosophy, that do not to him appear properly supported by reason and fact.

The objections to Linnæus's arguments, from the situa-

tion and proportion of the organs, are puerile and trifling; the facts, mentioned by that author, whether conclusive or not, are certainly true: and, if true, to call them in question, is to add considerably to their importance in the scale of argument. The same may, in general, be said of the argument drawn from the coincidence in point of time, of the *anthers* and *stigma:* though, in some particular instances, as spinach, mercury, hemp, maize, and juniper, the *stamina* commonly shed their dust before the *stigmata* or supposed female organs have attained maturity.

"In plants which have the *stamina* and seeds on distinct roots, the flowers, says Linnæus, generally come out before the leaves, lest the latter should cover the female organ, and prevent the access of the fertilizing dust." Willow and poplar are adduced as examples. In these instances, the fact is certainly as represented by the learned author; and the reason assigned for it, however imaginary, is ingenious. Dr. Alston finds great fault with Linnæus for qualifying his allegations with a *generally*. General affirmations are, in my opinion, highly proper in disquisitions of this kind, where the subjects are so numerous, that a separate examination of each is impracticable.

The argument for the sexes from castration is attempted to be refuted in two different ways.—1. Supposing its effect to be uniformly as represented by Linnæus, and the sexualists, it does not follow, says Alston, that the use of the powder of the *stamina* in fecundating the seeds is clearly demonstrated: as wounds in a necessary part of the plant, together with the loss of juice issuing from them, may well account for the consequent barrenness and abortion of the seeds. Malpighi affirms, that he produced a somewhat similar effect on the seeds of tulip, by plucking off the petals before their expansion. But, 2, says Alston, there is reason to deny the fact. In Geoffroy's Experiment on Maize, some of the ears ripened a few seeds, although the *stamina* were entirely cut out before the opening of the *anthers*. An experiment of the same kind performed by Dr. Alston himself, deserves attention. "Observing," says he, "one year, two

 "strong

" ſtrong tulips growing together, in an incloſure ſurrounded " with a tall and thick quickſet hawthorn-hedge, I cut " down two or three more tulips, which ſtood at ſome diſ-" tance from them, ſo as to leave none without that inclo-" ſure, ſave the two I mentioned; out of theſe, gently " opening the petals, I plucked all the *ſtamina* with their " *apices* ſtill entire. The conſequence of this too rude caſ-" tration was a conſiderable extravaſation of the juices in " the bottom of the flower, and a ſudden decay of the " *ovarium* or fruit, which never increaſed, but turned yellow, " ſhrunk and withered. In order to diſcover whether this " abortion was owing to the wounds, or to the want of the " duſt of the *apices*, I ſuffered theſe two tulips to remain in " the place where they were; and next ſeaſon, having ob-" ſerved the ſame precaution that no other tulip ſhould flower " within the incloſure, I opened the petals, and took out " carefully, not the ſtamina, but only all the *apices*, which " prevented any ſenſible bleeding of the parts. This more " gentle caſtration, they bore perfectly well; the *ovarium* " ſuffered nothing in either of them, but increaſed and came " to maturity, quite full of ſeeds."

Theſe experiments, ſo far from refuting the doctrine of the ſexes, ſeem, in my opinion, to confirm it. For though both Geoffroy and Alſton affirm that the fruit ripened and was filled with ſeeds, yet it does not appear that theſe ſeeds were ripe or capable of vegetation. The ſame thing poſ-ſibly happened to theſe plants, as to the date-tree of Father Labat, which bore ripe dates, the ſtones of which, however, never roſe. Be this as it may, the experiment juſt recited is imperfect and inconcluſive becauſe totally ſilent on that head.

The next ſet of arguments againſt the ſexes is derived from experiments on plants which have the pretended male and female organs of generation placed apart on diſtinct roots. Camerarius relates that, in the courſe of his expe-riments, he obſerved the female plants of ſpinach, mercury, and hemp, which had been placed without the reach of the male, produce ripe and perfect ſeeds; a circumſtance which,

as Valentini obferves, made Camerarius exprefs himfelf with doubt of the doctrine of the fexes, of which he had been a ftrenuous advocate. The following experiments of Dr. Alfton upon the fame plants, if faithfully narrated, bid fairer to be decifive on this fubject, than half the refined and ingenious arguments of his opponent.

"In fpring, 1737," fays the doctor, "I tranfplanted three "fets of the common fpinach, long before it could be "known whether they were flowering or feed-bearing plants, "from a little bed on which they were raifed, into a place "of the garden, full eighty yards diftant, and almoft direct-"ly fouth; there being two hawthorn and three holly "hedges, all pretty thick and tall, between them and their "feed-bed, and no other fpinach in the garden; all the three "proved fertile plants, and ripened plenty of feeds. I "fowed them, they grew, and profpered as well as any "fpinach-feed poffibly could do.

"The fame year, a few plants of the common hemp, "which I had raifed for a fpecimen from the feed, being "accidentally deftroyed when very young; and, finding "afterwards, about the end of June, a pretty ftrong, but "late plant of hemp, growing by itfelf, I caufed great care "to be taken of it, there not being that year any hemp raifed "within a mile of it that I could find. This plant grew "luxuriantly; and, though bad weather in the autumn made "me pluck it up a little too foon, yet I got about thirty good "feeds from it, which, the fucceeding fpring, produced as "thriving male and female plants, as if the mother hemp "had ftood furrounded with males."

It is, I confefs, a matter of no fmall difficulty for the Sexualifts to elude the force of the conclufion manifeftly deducible from the refult of thefe experiments, and to explain in a manner that fhall be fatisfactory to their opponents, how, on their favourite principle, in the total abfence of male plants, feeds fhould be produced *in great abundance*, which not only *feemingly* ripened, as in the cafe of the date-tree of Father Labat, but attained fuch perfect maturity, as to be capable of vegetation, and actually to vegetate. By this

his touchſtone, indeed, we are to try the intrinſic value of every experiment which has the determination of the preſent problem for its object: and it is only in conſequence of a ſeries of experiments of the ſame kind, undertaken without prejudice, accurately conducted, well authenticated, and tried by the teſt juſt mentioned, that the doctrine of the ſex of plants muſt ultimately ſtand or fall. It is not enough, however, (and the caution cannot be too often repeated) that plants ſeem only to ripen ſeeds without the aſſiſtance of the *pulvis antherarum*; thoſe ſeeds, to be perfect, and to render the argument concluſive, muſt contain the embryo of a new plant, which, upon being lodged in the ſoil, will unfold itſelf, and produce an individual in every reſpect ſimilar to its parent vegetable. For want of this neceſſary teſt, nothing can be concluded from M. Tournefort's aſſertion of a female hop which produced ripe fruit every year, in the king's garden at Paris, although no male of that ſpecies was to be found within many miles of it. For, without enquiring with Wahlbom, whether the cones of the hop be a calyx or a ſeed-veſſel, which, I think, has nothing to do with the preſent queſtion, I affirm that there is no evidence whatever, from Tournefort's Narration, that the ſeeds which he pretends were produced by this plant, made any efforts towards vegetation, or, indeed, that any trials were made for that purpoſe. The author is quite ſilent on this head; and hence the argument that has been erected upon his aſſertion is totally inconcluſive.

The argument for the ſexes from the culture of palm-trees has never received a ſatisfactory anſwer. Father Labat's teſtimony, which Alſton oppoſes to the clear and pointed evidences of other authors, makes, as we have ſeen, directly againſt him.

As to Herodotus's aſſertion that the date-trees, in the neighbourhood of Babylon, were fecundated by means of gnats, which, lodging in the fruit of the male palm, iſſued from it, and entered into that of the female, it is directly contradicted by the authority of every author, both ancient and modern, who has treated of the culture of palm-trees: and, if true, would but reduce that culture to the head of caprification,

 which

which is, in my opinion, one of the ſtrongeſt arguments for the ſexes that can poſſibly be advanced.

The differences among the authors who treat of the fecundation of date-trees, with reſpect to the manner in which the fertilizing duſt is conveyed to the female, and the conſequences of their ſterility, are much inſiſted upon by Alſton. But theſe differences prove nothing; ſince the authors in queſtion all agree in this, that the dates, to be fecundated, muſt have the aſſiſtance of the *pulvis antherarum* of the flowering palm.

The laſt argument I ſhall mention is drawn from a comparative view of the nature of ſeeds and buds. The ſmalleſt ſenſible particle of every plant, ſays Alſton, after Malpighi, is organized in the ſame manner as the whole. Hence, if planted in the ground, each piece would probably, in progreſs of vegetation, become a plant in every reſpect ſimilar to the parent vegetable. Hence, likewiſe, many plants are better and more eaſily propagated by cuttings, layers, off-ſets, germs or buds, than by ſeeds. Hence, garlick, onions, leeks, tulips, and lilies, frequently carry germs or cloves on the tops of the ſtalks, as well as at their roots under ground. A bud is the compendium or rudiment of a plant which only wants the power of extending or unfolding its parts. But ſeeds contain, likewiſe, the *primordia plantarum*; buds, therefore, contain the moſt eſſential parts of ſeeds, and differ from them only in the ſame manner as the living fœtus differs from the egg. In this view, buds are nothing elſe than ſeeds in a more perfect ſtate, or in a higher ſtage of vegetation. Now ſince buds are copiouſly produced by numberleſs plants, and often break out of the ſmoother part of the bark, eſpecially of pruned trees; and, ſince the ſmalleſt part of a plant may be made to grow, and emit gems, whether it be naturally fertile or barren, male, female or hermaphrodite;—why, continues the Doctor, may not ſeeds, which are only a more imperfect kind of buds, be produced, without the aſſiſtance of the *pulvis antherarum*, or the intervention of any mode of generation whatever?

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This argument is plaufible, but cannot overturn the direct evidence in favour of the fexes that has been already ftated.

I am far, however, from wifhing to obtrude my opinion upon the reader, or improperly influence his belief. The principal facts on both fides of this curious and important queftion lie before him; it belongs to him to eftimate their credibility and weight, and to determine accordingly. Opinions, if founded in truth, as they cannot be overturned by fophifms, fo neither can they fuffer from the minuteft examination. On the contrary, if eftablifhed in error, an exact and impartial fcrutiny is the moft probable means of removing the deception, by detecting their falfhood.

SILIQUA, a fpecies of pod, in which the feeds are alternately fixed to either future or joining of the valves; in this it differs from the *legumen*, which has its feeds attached to one future only. This kind of feed-veffel, which is found in all the crofs-fhaped flowers of Tournefort, or *tetradynamia* of Linnæus, is diftinguifhed, by the laft author, after Ray, from its form, into *filiqua* properly fo called, and *filicula*, or little *filiqua*. The former is much longer than broad, as in muftard, radifh, rocket, wall-flower, lady's fmock, and water-crefs. The latter is almoft round, the longitudinal and tranfverfe diameters being nearly equal; as in honefty, mad-wort, fhepherd's-purfe, fcurvy-grafs, candy-tuft, and fome other crofs-fhaped flowers. This difference in the form of the fruit is the foundation of the two orders in Linnæus's clafs *tetradynamia*, which correfponds to the *cruciformes* of Tournefort, and *filiquofæ* of Ray.

The feeds within both *filiqua* and *filicula* are attached, as to a placenta, to the futures or joining of the valves, by means of a fmall thread or foot-ftalk, which performs the office of the umbilical rope.

SILIQUOSÆ (*filiqua*, a pod) the name of a clafs in Morifon, Hermannus, Ray, and Royen's Methods, confifting of plants which have a *filiqua* for their feed-veffel. Of this kind are the crofs-fhaped flowers of Tournefort, and *tetradynamia* or plants having flowers with four long and two fhort ftamina of Linnæus.

SILIQUOSÆ is, likewiſe, the name of the thirty-ninth order in Linnæus's Fragments of a Natural Method, conſiſting of plants which have the general character juſt mentioned.

Liſt of Genera contained in this Natural Order.

SECTION I.

Croſs-ſhaped Flowers with long Pods, (ſiliquæ).

Linnæan Genera.	*Engliſh Names.*
Arabis,	Baſtard tower-muſtard.
Braſſica,	Cabbage, turnip, rape.
Bunias.	
Cardamine,	Ladies-ſmock.
Cheiranthus,	Stock, wall-flower.
Crambe,	Sea cabbage.
Dentaria,	Tooth-wort.
Eryſimum,	Hedge-muſtard.
Heliophila.	
Heſperis,	Rocket, queen's July-flower, or dame's violet.
Iſatis,	Woad.
Raphanus,	Radiſh.
Ricotia.	
Sinapis,	Muſtard.
Siſymbrium,	Water-creſs.
Turritis,	Tower-muſtard.

SECTION II.

Croſs-ſhaped Flowers with ſhort round Pods (ſiliculæ).

Alyſſum,	Mad-wort.
Anaſtatica,	Roſe of Jericho.
Biſcutella,	Buckler-muſtard.
Clypeola,	Treacle-muſtard.
Cochlearia,	Scurvy-graſs, or ſpoon-wort.
Draba,	Whitlow-graſs.
Iberis,	Candy-tuft, or ſciatica-creſs.
Lepidium,	Dittander, or pepper-wort.

Linnæan Genera.			English Names.
Lunaria,	—	—	Satin-flower, honesty, or moon-wort.
Myagrum,	—	—	Gold of pleaſure.
Peltaria.			
Subularia,	—	—	Rough-leaved alyſſon.
Thlaſpi,	—	—	Mithridate-muſtard, ſhepherd's purſe.
Vella,	—	—	Spaniſh-creſs.

Habit and Structure of the Plants of this Order.

This order chiefly furniſhes biennial and perennial herbs of an irregular figure; *braſſica,* ſea-cabbage, Spaniſh-creſs, and ſome ſpecies of ſtock and *thlaſpi,* form ever-green ſhrubs of a round and beautiful figure.

The ROOTS are long, branched, crooked, and fibrous. Thoſe of turnip and radiſh are ſucculent and fleſhy. In tooth-wort, they appear jointed.

The STEMS and young branches are cylindric.

The LEAVES, which differ in point of form, being ſometimes ſimple, ſometimes winged, are generally placed alternate. In a ſpecies of thlaſpi with a red flower, and a perennial ſpecies of moon-wort, the leaves at the bottom of the ſtalk and branches are oppoſite.

From the arm-pits of the leaves of a ſpecies of treacle-muſtard, iſſues a large, erect thorn. The plant is generally known by the name of ſhrubby prickly alyſſon.

The FLOWERS are hermaphrodite, and in the greater number, diſpoſed in a ſpike at the extremity of the branches. They are eaſily rendered double by culture.

The FLOWER-CUP is compoſed of four leaves, which are oblong, hollow, blunt, bunched at the baſe, and fall with the flower. Theſe leaves are ſometimes erect, as in Spaniſh-creſs, radiſh, hedge-muſtard, ſtock, cabbage, rocket, and tooth-wort; ſometimes ſpread horizontally, as in muſtard, water-creſs, woad, and lady's-ſmock.

The PETALS, which are four in number, ſpread at top, and are diſpoſed like a croſs; whence the name of croſs-

ſhaped flowers, by which Tournefort has deſigned this natural order; a characteriſtical mark which, becauſe more obvious, is, in my opinion, preferable to that derived from the inequality of the ſtamina.

The claws, or lower part of the petals, are erect, flat, awl-ſhaped, and ſomewhat longer than the calyx. The upper part widens outwards. In candy-tuft, the petals are unequal, the two outermoſt being much larger than the other two. A ſpecies of lady's-ſmock, the *cardamine impatiens* of Linnæus, as likewiſe the *lepidium ruderale* of the ſame author, want the petals.

The STAMINA are ſix in number, two of which are of the length of the calyx, and the remaining four ſomewhat longer, but ſhorter than the petals. Upon the circumſtance of the inequality of the ſtamina, combined with their number, is founded the claſs *tetradynamia* of the Sexual Method, which contains all the croſs-ſhaped flowers.

The ANTHERS are of an oblong figure, pointed, thicker at the baſe, and erect. In a ſpecies of Spaniſh-creſs, the *vella pſeudo-cytiſus* of Linnæus, the four longer filaments are caſtrated, or want tops. Some ſpecies of dittander have only two ſtamina; a Virginian ſpecies of the ſame genus has three. The two leſſer filaments in mad-wort are indented at the baſe; in which circumſtance conſiſts the eſſential character of the genus. In a ſpecies of lady's-ſmock, the *cardamine hirſuta* of Linnæus, the two leſſer ſtamina are generally wanting. In ſea-cabbage, each of the longer filaments is divided at top into two parts; the *anthers* being placed upon the outermoſt branch.

Betwixt the *ſtamina* in plants of this order, are generally lodged one, two, or four round greeniſh knots, which in ſome genera are ſo ſmall as to elude the ſight. Theſe knots, called by Linnæus GLANDULÆ NECTARIFERÆ, and uſed by that author as an eſſential character in diſcriminating the genera, ſeem to be prominences of the receptacle of the flower, occaſioned by the ſtamina being deeply lodged in its ſubſtance. This opinion ſeems more probable, as in treacle-muſtard, rough-leaved alyſſon, gold-of-pleaſure, and ſome

others,

others, which have the ſtamina ſlightly attached to the ſurface of the receptacle, no knots or glands are obſerved. In baſtard tower-muſtard, the knots in queſtion are placed betwixt the leaves of the calyx, to which they ſeem appendages or ears. In the greater number they are ſeated between, or cloſe to, the ſtamina, particularly the two ſhorter ones, to the baſe of which they are faſtened.

The SEED-BUD is ſingle, and ſtands upon the receptacle of the flower. The *ſtyle*, which is either cylindric, or flat like a ſcale, is of the length of the four longer ſtamina in the plants of the ſecond order; in thoſe of the firſt, it is very ſhort, or even wanting. It accompanies the ſeed-bud to its maturity. The *ſtigma* or ſummit of the ſtyle is blunt; and ſometimes, as in ſtock and rocket, deeply divided into two parts.

The SEED-VESSEL is a long pod in plants of the firſt ſection; a ſhort and round one, in thoſe of the ſecond. Either ſort has two valves or external openings, and in a great many genera, the ſame number of internal cavities, the partition of which projects at the top beyond the valves. In a ſpecies of gold-of-pleaſure, the myagrum monoſpermum latifolium of Caſpar Bauhin, there are three cells, two of which, being thoſe next the top of the pod, prove abortive; the remaining cell at the baſe contains a ſingle ſeed. In radiſh, the pods are jointed; in hedge muſtard, ſquare.

The SEEDS are roundiſh, ſmall, and attached alternately by a ſlender thread to both ſutures or joinings of the valves.

Theſe plants have a watery, ſharp, lixivial taſte, and are charged with a fixed alkaline ſalt, which is drawn from them by burning, and being diſtilled, without any addition, produces a volatile alkali.

Moſt of the plants in queſtion have a ſtinking ſmell. *Eryſimum alliaria*, and a ſpecies of thlaſpi, ſmell ſtrongly of garlick.

With reſpect to their virtues, they are attenuating, deterſive, diuretic, and antiſcorbutic. Theſe qualities, however, are moſt eminently poſſeſſed by the live plants; when

 dried,

dried, they either entirely difappear, or are greatly diminifhed.

Applied externally, thefe plants are ufeful in difeafes of the fkin, as itch and leprofy.

SOLUM *plantarum*. The natural foil of plants. Each fpecies of plant affects a particular foil in preference to every other. In the culture of plants, therefore, it is of very great importance to have a diftinct knowledge of their foil and loca natalia, that the nature of the foil and earth in which they are cultivated may be made to approach, as near as poffible, to that in which they fpontaneoufly grow.

This fubject then, as is evident, pertains more properly to gardening than botany. To the former, indeed, it ferves as a proper and folid foundation; in the latter it is merely a curious fpeculation, which, however, cannot fail, if properly handled, of affording inftruction as well as amufement.

The reader is referred, for ingenious conjectures on this fubject, to the head ADUMBRATIONES in Linnæus's *Philofophia Botanica*.

SPADICEUS *flos*, (from *fpadix*); an aggregate flower, in which the receptacle is inclofed within a *fpatha* or fheath that is common to many florets. This term, ufed by the ancients only of palms, is extended by Linnæus to all flowers which, like narciffus, calla, dracontium, pothos, arum, and zoftera, are protruded from that fpecies of common calyx called a *fpatha* or fheath.

SPADIX, anciently fignified the receptacle of the palms. It is now ufed to exprefs every flower-ftalk that is protruded out of a *fpatha* or fheath.

The fpadix of the palms is branched; that of all other plants, fimple. This laft cafe admits of fome variety. In calla, dracontium and pothos, the florets cover it on all fides; in *arum*, they are difpofed on the lower part only; and in zoftera, on one fide.

SPATHA, a fheath; a fpecies of calyx which burfts lengthways, and protrudes a ftalk fupporting one or more flowers,

flowers, which commonly have no *perianthium* or proper flower-cup.

The ſpatha opens on one ſide, from bottom to top, and conſiſts either of one piece, as in narciſſus, ſnow-drop, and the greater number of ſpathaceous plants; of two, as in marſh-aloe; or of a number of ſcales laid over one another like tiles, as in plantain-tree.

SPATHACEÆ (from *ſpatha*, a ſheath) the name of the ninth order in Linnæus's Fragments of a Natural Method, conſiſting of plants whoſe flowers are protruded from a *ſpatha* or ſheath.

Liſt of the Genera *contained in this Natural Order.*

Linnæan Genera.			*Engliſh Names.*
Allium,	—	—	Garlick, onion, &c.
Amaryllis,	—	—	Lily-daffodil.
Bulbocodium.			
Colchicum,	—	—	Meadow-ſaffron.
Crinum,	—	—	Aſphodel-lily.
Galanthus,	—	—	Snow-drop.
Gethyllis.			
Hæmanthus,	—	—	Blood-flower.
Leucoium,	—	—	Greater ſnow-drop:
Narciſſus,	—	—	Daffodil.
Pancratium,	—	—	Sea daffodil.

Theſe plants are nearly allied in habit and ſtructure to the liliaceous plants, from which they are chiefly diſtinguiſhed by the *ſpatha* or ſheath out of which their flowers are protruded. *Vide* CORONARIÆ.

SPICA, properly an ear of corn, a ſpike; a mode of flowering, in which the flowers are ranged alternately upon both ſides of a ſimple common flower-ſtalk. The term is exemplified in arum, American night-ſhade, pepper, and ſeveral of the graſſes. The flowers in a ſpike are ſeated immediately upon the ſtalk, without any partial foot-ſtalk, in which it differs from the *racemus* or cluſter. A ſpike is ſaid

ſaid to be ſingle-rowed (*ſpica ſecunda*) when the flowers are are all turned towards one ſide, as in *dactylis cynoſuroides*; double-rowed (*ſpica diſticha*) when they look to both ſides, or ſtand two ways.

SPINA, a thorn; a ſpecies of armature or offenſive weapon, protruded from the wood of the plant, and, therefore, of a ſtronger and harder nature than prickles, which are detached portions of the bark.

Thorns are either ſimple, as in moſt plants; double, as in horned acacia; or triple, as in another ſpecies of acacia, hence termed triple-thorned.

Spines are protruded either from the ſtem and branches, as in buck-thorn, pear, plum, and orange-trees; from the foot-ſtalks of the leaves, as in falſe acacia; from the leaves themſelves, as in aloe, American aloe, Adam's needle, holly, manchineel, carline-thiſtle, artichoke, bear's-breech, juniper, milk-wort, butcher's-broom, and ſea-pink; from the ribs of the leaves, as in ſeveral of the night-ſhades; from the calyx, as in thiſtle, centaury, and mad-apple; or, laſtly, from the ſeed-veſſel or fruit, as in caltrops, ſpinach, agrimony, and thorn-apple.

Some plants loſe their ſpines, as the branches of pear, citron, orange, lemon, medlar, hawthorn, and gooſeberry buſh, by culture; the leaves of holly, by age.

M. Duhamel compares thorns, which are an expanſion of the lignous body, to the horns of animals, which adhere to the bones of the ſcull, and are protruded from them.

STAMINA, threads or chives. The ſlender threads which in moſt flowers are placed round the ſeed-bud. They are defined by Linnæus to be entrails of the plant, deſtined for preparing the *pollen* or fine powder which the Sexualiſts affirm to be the main agent in the generation of plants.

The form of each ſtamen is generally that of a ſlender thread, ſurmounted by a ſmall prominence or button containing a powder. Hence its diviſion into,

Filamentum, the ſlender thread-ſhaped part reſembling a foot-ſtalk, which ſupports the

Anthera,

Anthera, or ſummit, a ſmall ſack or capſule with one or two cavities, attached differently to the filament.

Pollen, the fecundating duſt contained within the anthers, which diſcharge it when ripe.

Each of theſe terms is particularly explained under its reſpective head.

STELLATÆ (*ſtella*, a ſtar) the name of a claſs in Hermannus, Boerhaave, and Ray's Methods, conſiſting of plants with two naked ſeeds, and leaves diſpoſed round the ſtem in the form of a radiant ſtar. The term is exemplified in madder, lady's bed-ſtraw, croſs-wort, and woodroof.

STELLATÆ is, likewiſe, the name of the forty-ſeventh order in Linnæus's Fragments of a Natural Method, conſiſting of plants which poſſeſs the general characters juſt mentioned.

Liſt of the Genera *contained in this Order.*

	Linnæan Genera.		*Engliſh Names.*
α	*Anthoſpermum*,	—	Amber-tree.
	Aſperula,	— —	Woodroof.
	Crucianella,	— —	Petty madder.
	Diodia.		
	Galium,	— —	Ladies bedſtraw, or cheeſe-rennet.
	Hedyotis.		
	Knoxia.		
	Lippia.		
	Phyllis,	— —	Baſtard hare's-ear.
	Richardia.		
	Rubia,	— —	Madder.
	Sherardia,	— —	Little field-madder.
	Spermacoce,	— —	Button-weed.
	Valantia,	— —	Croſs-wort.
β	*Houſtonia*.		
	Oldenlandia.		
	Ophiorrhiza.		
	Spigelia,	— —	Worm-graſs.

γ *Coffea*,

Linnæan Genera.	English Names.
Coffea, — —	Coffee-tree.
Cornus, — —	Dogwood, or cornelian cherry.
Ixora.	
Pavetta.	
Psychotria.	

This order, which, in its preſent form, is far from Natural, contains herbs, ſhrubs, and trees. The herbs, which are moſt numerous, are chiefly annual, and creep along the ſurface of the ground. The ſhrubs and trees are chiefly evergreens, which riſe erect, and are of an agreeable conic form.

Theſe plants are of an opening nature; their ſeeds, particularly thoſe of coffee, are bitter and cordial. *Galium verum* poſſeſſes the property of curdling milk. The roots of madder are greatly eſteemed by dyers for the beautiful-red colour which is procured from them. A ſpecies of hedyotis poſſeſſes the ſame quality. An infuſion of arapabaca or *ſpigelia* is ſpecific againſt worms; whence the Engliſh title of worm-graſs by which this genus of plants has been deſigned. The roots of ophiorrhiza, as the name imports, preſerve from the dangerous conſequences of the venomous bites of ſerpents.

STIGMA, (properly a mark or brand, à στιζω, pungo,) the ſummit of the ſtyle, accounted by the ſexualiſts the female organ of generation in plants, which receives the fecundating duſt of the tops of the ſtamina, and tranſmits its vapour or effluvia through the ſtyle into the heart of the ſeed-bud, for the purpoſe of impregnating the ſeeds.

Moſt plants have a ſingle ſtigma. Lilac has two of theſe organs; bell-flower three; in French willow, herb, and graſs-of-Parnaſſus, they are four in number; in winter-green, five. With reſpect to figure, the ſtigma is either round, as in primroſe; oval, as in genipa; croſs-ſhaped, as in penæa; ſhaped like a target, as in water-lily, poppy, and

and ſide-ſaddle flower; in the form of a crown, as in winter-green; hooked, as in violet and American viburnum; ribbed or furrowed, as in meadow-ſaffron; ſhaped like a head (*capitatum*) as in periwinkle, caltrops, ſcarlet-convolvulus, and cluſia; angular, as in muntingia; of the nature of a leaf, as in iris; or covered with down, as in cucubalus, rhubarb, tamariſk, the graſſes, and moſt of the pea-bloom flowers.

The diviſions of the ſtigma are ſlender like hairs, as in dock; twiſted into ſeveral convolutions, as in crocus; turned backwards, as in campanula, pink, and the compound flowers; or bent to the left as in viſcous campion. Theſe diviſions are generally two in number; in aſarabacca, the ſtigma is deeply cut into ſix parts, and in turnera, more ſlightly into a greater number.

The number of ſtyles is to be reckoned from their immediate inſertion into the ſeed-bud. Whatever diviſions are above that inſertion, are only ſegments of the ſtyle or ſtigma. Without attending to this diſtinction, we might frequently be apt to refer certain genera of plants, from a ſuperficial view of the number of their ſtyles, to an improper order in Linnæus's Method, the ſecondary diviſions of which are derived from the number of ſtyles, reckoned, as we have ſaid, from their inſertion into the ſeed-bud.

In flowers which have no ſtyle, the ſtigma adheres to the ſeed-bud; and its number, like that of the ſtyles, ſerves as a foundation to the orders in the Linnæan Method of arrangement. Thus poppy, prickly poppy, celandine, may-apple, herb-chriſtopher, caper, and water-lily, which have a ſingle ſtigma, are referred to an order of plants having one ſtyle, although the ſtyle in theſe plants be totally wanting.

With reſpect to duration, the ſtigma generally withers without falling off; in poppy, water-lily, and ſide-ſaddle-flower, it is permanent.

The ſurface of the ſtigma is covered with a clammy moiſture, which ſerves to diſſolve the particles of the fertilizing duſt of the anthers, and thereby more eaſily tranſmit its effluvia and eſſence, which Linnæus calls the *aura ſeminalis*,

to

to the ſeeds below. The experiments of Juſſieu, Vaillant, and Needham, have left no room for doubt on this matter.

The ſtigma, when ſingle, generally terminates the ſtyle. When there are ſeveral *ſtigmata*, as in cotton, and moſt of the liliaceous plants, they are diſpoſed with admirable ſymmetry along its ſides. In American *viburnum*, *petrea*, and *lippia*, the *ſtigma*, which is ſingle, is placed upon the ſide of the ſtyle, or rather obliquely on its extremity.

STIMULI, ſtings; a ſpecies of armature or offenſive weapon, with which ſome plants, as nettle, *caſſada*, *acalypha*, and *tragia* are furniſhed. Their uſe, ſays Linnæus, is, by their venomous punctures, to keep off naked animals that would approach to hurt them.

STIPES properly ſignifies the trunk of a tree. By Linnæus it is uſed to denote the trunk of the muſhrooms, the baſe of the footſtalk in the fern and palm tribes, as likewiſe the ſlender thread, which, in many of the compound flowers, elevates the feathery or hairy crown *(pappus)* with which the ſeeds are furniſhed, and connects it with the ſeed. The appearance in queſtion is conſpicuous in gum-ſuccory, dandelion, baſtard hawk-weed, *ſeriola*, *hypochoeris*, colt's-foot, and ſome ſpecies of wild lettuce.

STIPULA, (ſtraw, ſtubble); one of the *fulcra* or ſupports of plants, defined by Linnæus to be a ſcale or ſmall leaf, ſtationed on each ſide the baſe of the foot-ſtalks of the flower and leaves at their firſt appearance, for the purpoſe of ſupport. Elmgren reſtricts it to the foot-ſtalks of the leaves only

Malpighi was the firſt who made obſervations on the number, figure and ſituation of this auxiliary part of the plant. Linnæus has improved upon Malpighi's obſervations, and called in the *ſtipulæ* as eſſential characters in diſcriminating the ſpecies.

The appearance in queſtion is conſpicuous in tamarind, caſſia, roſe, honey-flower, tulip-tree, apricot, peach, bird-cherry, and the pea-bloom flowers.

Stipulæ exhibit the ſame variety in form and ſtructure as the leaves, at whoſe inſertion they are frequently placed.

The

The greater number of plants have two *ſtipules*, one on each ſide of the foot-ſtalk: in the African ſpecies of honey-flower and butcher's broom, there is only a ſingle ſcale of this kind, which, in the former, is placed on the inſide, in the latter, on the outſide of the ſtalk.

With reſpect to duration, ſome *ſtipulæ* fall before the leaves, as in cherry, bird-cherry, almond, poplar, lime, elm, oak, beech, horn-beam, hazel-nut, birch, alder, fig, and mulberry: others are permanent, or continue till the fall of the leaves, as in roſe, raſpberry, ſtrawberry, cinquefoil, tormentil, avens, and the pea-bloom flowers.

In moſt plants the *ſtipulæ* are detached from the ſtalk: in roſe, cinquefoil, *comarum*, raſpberry, and honey-flower, they grow cloſe to the plant.

In fig and mulberry-trees, the *ſtipulæ* are produced on the inſide of the leaves: in birch, lime, and the pea-bloom flowers, on the outſide; in platanus, they form a ſort of ruff, which ſurrounds the branches.

Laſtly, in the lipped, and croſs-ſhaped flowers of Tournefort, the rough-leaved and ſtarry plants of Ray, the natural order *orchideæ*, the liliaceous plants, and ſeveral of the compound flowers, the *ſtipulæ* or ſcales in queſtion are wanting.

The *ſtipulæ* frequently afford excellent marks of diſtinction in diſcriminating the ſpecies. Thus, the African and Ethiopian ſpecies of honey-flower are eſſentially diſtinguiſhed from one another by the number and ſituation of the *ſtipulæ*; which, in the former, are ſingle, and grow cloſe to the ſtalk: in the latter, double, and detached from it. In like manner, the kidney-ſhaped, and bearded or hairy *ſtipulæ* of *caſſia auriculata* diſtinguiſh that ſpecies from all its congeners.

STROBILUS, (properly a pine-apple, as likewiſe an artichoke, which in figure reſembles it);—in the modern botanical nomenclature, a cone; a ſpecies of ſeed-veſſel compoſed of woody ſcales, which are placed againſt one another, and ſplit only at top, being fixed below to an axis which occupies the centre of the cone. The term is exemplified in pine, fir, cypreſs, and the other cone-bear-

ing plants, whofe habit and ftructure are particularly defcribed under the article CONIFERÆ, which fee.

STRUCTURA *vegetabilis*. The ftructure or internal organifation of plants.

The organifation and internal ftructure of the different parts of vegetables, fuch as the ftems and branches, the leaves, the calyx, the petals, and feeds, is not exactly the fame; in fome they are formed of two or three, in others of all the fimple organical parts contained in the bark and wood of the ftem, in which the organifation is moft apparent.

The bark of the trunk is compofed of four fimilar parts, viz. I. the epidermis, cuticle or fcarf-fkin, which infolds the beds of the bark. II. Veffels containing the fap. III. Veffels containing the blood or proper juice of the plant. IV. The cellular web or tiffue.

I. The epidermis is a very fine membranous fubftance fpread over the bark, and is always tranfparent and elaftic, without colour or any fenfible organifation, fome very fmall pores excepted, which are fometimes difcovered in its fubftance, and probably ferve the double purpofe of throwing off the fuperfluous nourifhment, and imbibing new.

II. The fap-veffels are woody longitudinal fibres, which are hollow, and almoft inconceivably fine. They are devoid of ramifications, and fo fituated, with refpect to one another, as to form a web of feveral bundles in form of a net, the mefhes of which are longer than broad. Thefe fmall bundles are the true vegetable mufcles, and differ in their figure from thofe of animals, which are formed of large maffes of fibres accumulated one above another.

III. The proper veffels, called likewife, from their ufe, vegetable blood-veffels, are ftraight longitudinal fibres, larger than the fap-veffels, and lefs numerous. They are filled with the proper juice, which is generally coloured, and is, in fact, the blood of the plant. Of this kind is the milk of fpurge, dog's-bane, and fig, the yellow juice of celandine, the refin of fir and pine-trees, and the mucilage of plants of the mallow tribe.

IV. The

IV. The cellular web, or tiſſue, is an aſſemblage of little bladders, without any ſenſible communication, which fill the interſtices of the net formed by the ſap-veſſels, and traverſe the whole ſubſtance of the bark and wood, from the pith, or medullary ſubſtance in the centre, of which it is only a prolongation, to the epidermis or ſkin of the bark, where it is much ſlenderer than towards the centre of the wood.

The ſubſtance in queſtion is diſtinguiſhed by different names from the ſtructure of the parts in which it is found. When contained in the ſmall meſhes of the woody longitudinal fibres or ſap-veſſels of the trunks and roots of trees, it is termed, as we have ſaid, the cellular tiſſue; when collected into larger voids, formed by meſhes that are placed more remote from each other, as in the leaves, it takes the name of parenchyma; when it forms a bed betwixt the epidermis, and the beds of the bark, as happens in the bark of herbs, and of the young branches of trees, it is termed the cellular cover: and when collected in the heart of the plant within the wood, is known by the name of the pith, marrow, or medullary ſubſtance.

In its ſtate of parenchyma and cellular cover, each bladder is of a deep green colour, herbaceous and ſucculent.

The pith, as we have juſt obſerved, is only a modification of the cellular tiſſue. This appears from its originally aſſuming the exact form, colour, and conſiſtence of that ſubſtance. Thus, the pith of all the new productions of trees conſiſts of a number of oval, green, and ſucculent bladders, exactly like thoſe of the bark and wood; and it is not till the end of one or two years, that theſe bladders become empty, dry up, aſſume a ſpherical form, and finally take the conſiſtence and colour of pith, which, in the greater number of plants, is white; in ſome, as horſe-cheſnut, yellow, or ruſt-coloured; in others, as walnut, brown; and in others, red.

The principal ſeat of the pith in thoſe plants which abound in it, is in the heart of the lignous body, where it is contained as in a tube, which ſerves to diffuſe it into the ſubſtance of the wood and bark. Herbs and ſhrubs have, in

 general,

general, a greater quantity of pith than trees. In elm, oak, hazel, pear and apple-trees, there is ſcarce any pith; in guaiacum, ebony, iron-wood, and the roots of tobacco, and thorn-apple, it is entirely wanting. Walnut, holly, aſh and pine, have but an inconſiderable quantity: elder-tree, hawthorn, fig-tree, ſumach, and wormwood, produce it in great abundance.

Notwithſtanding its thickneſs, the pith in the heart of trees diſappears inſenſibly; the canal which contains it, as the plant waxes old, contracts itſelf by degrees, and the loſs of pith is ſupplied by the enlarged dimenſions of the ſap and blood-veſſels which traverſe its ſubſtance, although leſs ſenſible to obſervation in its ſtate of pith. It is doubtleſs theſe veſſels, at firſt inſenſible, which furniſh the turpentine that oozes from the pith of pine and fir trees.

The bladders of the medullary ſubſtance are larger in the centre than towards the body of the wood; and it is obſerved in general, that thoſe herbs which have the greateſt quantity of pith have likewiſe the largeſt bladders. The ſame does not hold in trees. Elder-tree has a great quantity of pith, yet very ſmall bladders.

The innermoſt part of the bark, or that which is next the wood, is termed *liber*, from its fine and thin plates reſembling the leaves of a book.

The wood, or lignous body, is compoſed of the ſame conſtituent parts as the bark, except the epidermis, which, in that body, is ſupplied by the bark itſelf. It likewiſe poſſeſſes a fourth part, or ſeries of veſſels, not to be found in the bark. Theſe are the tracheæ, or veſſels which receive and tranſmit the air neceſſary for preparing and giving motion to the humours.

The tracheæ, or air veſſels, are tubes formed of elaſtic plates twiſted ſpirally in a direction contrary to the apparent diurnal motion of the ſun. Theſe tubes are of larger diameter than all the other veſſels that are found in the wood, or bark, even thoſe containing the proper juice or blood of the plant, and, according to the obſervation of Malpighi, are larger in the roots than in the trunk.

The lignous beds are, at firft, foft and tender, and acquire folidity only by degrees. They form fo many concentric circles or rings, the outermoft of which, or thofe next the bark, being of later production, are fofter and lefs coloured than thofe which are lodged nearer the centre. It is thefe innermoft beds that form the body of the wood properly fo called: the outer beds, which are of a much fofter texture, and frequently of a different colour, being called alburnum, which is only another term for tender imperfect wood, that has not yet acquired its ultimate degree of folidity. This fubftance is only found in the hard woods, fuch as ebony, pomegranate, oak, and pine-trees. In the foft woods, on the contrary, which never acquire any great degree of folidity, fuch as baobab, filk-cotton tree, lime-tree, afpen, alder, and birch, there is no alburnum, or, perhaps, to fpeak more properly, there is no wood; the lignous body remaining always in its firft ftate of alburnum, without acquiring any further degree of folidity.

Such, in general, is the organifation of vegetables, which in no part is fo confpicuous as in the ftem. The fame organifation, according to Grew, obtains in every part of the plant, as the root, leaves, and each, even the minuteft, part of fructification. More recent experiments on this fubject feem, however, to evince, that the ftructure of all the parts is not exactly the fame; a few of the conftituent parts of the ftem being entirely wanting in fome of the other parts.

The external parts of plants are by fome modern naturalifts denominated productions and terminations of the internal. The leaves, *bracteæ*, and calyx, are confidered by fuch authors as prolongations of the coarfe outer bark; the petals and ftamina of the liber or fine inner bark; the *piftillum* of the pith. The wood is, in fome fort, the fkeleton or mafs of bones which preferves all thefe parts in their place, and concurs with them in performing the vital functions. Hence in the opinion of thefe authors, the bark and pith conftitute the effence of the vegetable body.

Notwithftanding thefe affertions, it is certain that the organifation of the leaves is nearly the fame with that of the

 ftem.

ftem. They are, in fact, a fort of flat compreffed ftems; compofed, like the part laft mentioned, of an epidermis, a cortical body on both fides, and a lignous body in the centre. They differ only in two particulars: 1, That their epidermis, or fcarf-fkin, is furnifhed with a number of cortical glands, which, in herbaceous vegetables, are lodged on both furfaces; in trees, on the under furface only. 2, That the cellular tiffue or parenchymatous fubftance is found in much greater abundance in the leaves than ftems of plants, and is always green and fucculent, never paffing into the ftate of pith.

The calyx, or external cover of the flowers, which is generally green, does not differ fenfibly in its organifation from the leaves, unlefs that it frequently wants the lignous body.

The petals feem almoft entirely compofed of *tracheæ*, or air-veffels. They want the cortical glands in their epidermis, which are found on the furface of the leaves and flower-cups.

For further obfervations on the anatomy of plants, the reader is referred to the works of Grew, Malpighi, and Duhamel, who have handled this curious fubject with the utmoft accuracy and minutenefs.

STYLUS, the ftyle; the flender part of the *piftillum* or female organ, refembling a pillar, and correfponding to the *vagina* in animals, which ftands upon the feed-bud, and elevates the *ftigma*.

The number of ftyles, generally fpeaking, is equal to that of the feed-buds, each feed-bud being furnifhed with its own particular ftyle. The compound flowers, cone-bearing plants, rofe, ranunculus, tulip-tree, and many other plants, evince this to be their natural ftructure.

There are, however, plants which have more than one ftyle for a fingle feed-bud, as the umbelliferous plants; and there are others, which, on the contrary, have a fingle ftyle common to many feed-buds, as the rough-leaved plants and moft of the lipped-flowers. In a third fet of plants which feem to form a medium betwixt the two former, the ftyle is fingle

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at its origin, but ſoon branches out into as many ramifications as there are cells in the cavity of the ſeed-bud. Of this kind are the plants of the geranium and mallow tribes, which have their ſtyles divided above into five branches, correſponding to the five diviſions of the ſeed-bud or capſule.

The diviſions or branches juſt mentioned are either two in number, as in perſicaria, cornutia, and ſebeſten, in which laſt the ſtyle is forked, each of the two branches being ſubdivided into two; three, as in clethra and frankenia; four, as in buckthorn and alaternus; or five, as in Syrian mallow.

The number of ſtyles, and in their abſence, of *ſtigmata*, ſerves as a foundation to moſt of the orders or ſecondary diviſions in the ſexual method.

With reſpect to figure, the ſtyle is either cylindrical and hollow like a tube, as in moſt plants; angular, as in Indian flowering-reed and ſome liliaceous plants; awl-ſhaped, as in geranium; ſlender like a hair, as in *ceratocarpus*; or club-ſhaped above, as in greater ſnow-drop.

In point of proportion and dimenſions, the ſtyle is either of the length of the *ſtamina*, as in tobacco, and moſt plants; very long, as in tamarind, caſſia, campanula, viper's-graſs, Turkey-wheat, and the nodding or drooping flowers, as ſnow-drop and fritillaria; very ſhort, as in dog's bane, red jaſmine, and moſt of the other plants of the natural order, *contortæ*; thicker than the *ſtamina*, as in greater ſnow-drop; of equal thickneſs, as in dead-nettle; or ſlenderer, as in *ceratocarpus*.

In the greater number of plants, the ſtyle is ſeated upon the ſummit of the ſeed-bud; in roſe, raſpberry, ſtrawberry, cinque-foil, tormentil, avens, dryas, and marſh-cinque-foil, the ſtyles, which are numerous, iſſue from within the ſide of their reſpective ſeed-buds. In ſuriana, hirtella, ladies-mantle, percepier, and cocoa-plum, they are frequently produced at the baſe of the ſeed-bud: and in caper and burning-thorny-plant they ſtand both above and below it.

With reſpect to duration, the ſtyle either falls with the other parts of the flower, as in moſt plants: or accompanies

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the fruit to its maturity, as in the croſs-ſhaped flowers, the *tetradynamia* of the ſexual method.

SUCCULENTÆ (*ſuccus*, juice) the name of the thirteenth order in Linnæus's fragments of a natural method, conſiſting of flat, fleſhy, ſucculent plants, moſt of which are evergreen.

Liſt of the Genera *contained in this Order.*

	Linnæan Genera.		English Names.
α	*Aizoon.*		
	Cactus,	— —	Melon-thiſtle, torch-thiſtle, Indian-fig.
	Galenia.		
	Meſembryanthemum,	—	Fig-marigold.
	Neurada.		
	Reaumuria.		
	Tamarix,	— —	Tamariſk.
	Tetragonia.		
β	*Cotyledon,*	— —	Navel-wort.
	Craſſula,	— —	Leſſer orpine.
	Penthorum.		
	Rhodiola,	— —	Roſe-root.
	Sedum,	— —	Leſſer houſe-leek, ſtone-crop.
	Sempervivum,	— —	Houſe-leek.
	Septas.		
	Suriana.		
	Tillæa,	— —	Small annual houſe-leek.
γ	*Claytonia.*		
	Nama.		
	Portulaca,	— —	Purſlain.
	Seſuvium.		
	Trianthema,	— —	Horſe-purſlain.
δ	*Adoxa,*	— —	Tuberous moſchatel, or hollow-root.
	Chryſoſplenium,	— —	Golden ſaxifrage.
	Hydrangea.		
	Mitella,	— —	Baſtard American ſanicle.
	Saxifraga,	— —	Saxifrage.
	Tiarella.		

I decline

I decline entering into the charaсters of this numerous order, as I cannot regard it in any other light than as an aſſemblage of two or three natural orders, the charaсters of which ought, therefore, to be preſerved diſtinct.—The ſucculent plants are refreſhing, aſtringent, and of very wholeſome uſe.

The leaves of purſlain are uſed in ſallads, as are likewiſe the berries of the opuntias (*Cactus*).

The fruit of tamariſk is aſtringent, and uſed in hæmorrhages.

The juice of the leaves of houſe-leek is an excellent coſmetic.

Galenia has a warm, poignant, and ſomewhat aromatic taſte reſembling pepper, which, however exceeds it in ſtrength.

Externally, the leaves of purſlain are ſucceſsfully employed in St. Anthony's fire, and other inflammations of the ſkin. The Americans apply the cereus's or torch-thiſtles, to promote the union of fractured bones.

From the *anacampſeros purpurea* of Bauhin, the *ſedum foliis planiuſculis* of Linnæus, is procured by maceration, a water, which is reckoned by the Siberians an excellent vulnerary, and in ſuch eſtimation, ſays Gmelin, that they ſcruple not to believe it endued with the ſingular virtue of raiſing the dead to life.

Indian-fig, the *cactus ficus Indica* of Linnæus, has no ſtem. The leaves, which are fleſhy, thick, and oval, grow out of one another as by joints. At the ſummit of the leaf iſſues the flower. The plant does not riſe high, and in ſome ſort creeps. The briſtly ſpines or prickles, with which the leaves are armed, harden as the plant increaſes in age. Indian-fig is refreſhing, and ſtains the urine of ſuch as uſe it internally of a red colour.

The cochineal ſhrub is the *cactus cochinillifer* of Linnæus. The leaves are two fingers thick, of a beautiful green, and very prickly. The flowers are of a pale roſe-colour, and ſucceeded by a fig-like fruit, which, when ripe, is full of a deep purple pulp, containing a number of very ſmall flat

rough feeds that are as red as blood within. Upon this plant, which is a native of Mexico and the Weft-India Iflands, is found the infect or bug called cochineal, which is ufed by the dyers as their principal bafis for the fcarlet colour. It is a fix-legged viviparous infect, the female of which is only ufed. This is produced from the egg in its perfect form, and undergoes no transformation afterwards. It has no wings, nor, indeed, has it ufe for any, the greateft part of its life being fpent on the vegetable whereon it feeds. Father Plunier was the firft who corrected the miftaken notion, which had long univerfally prevailed, of its being a vegetable production; M. de Reaumur firft explored with accuracy its natural hiftory and origin.

SUCCUS. The juices of plants.

The vegetable juices or fluids are generally reduced to two; the lymph or fap; and the blood or proper juice. It appears, however, that plants contain many other fluids; for in a fingle fruit, fuch as a pine-apple, orange or ftrawberry, we can diftinguifh by the tafte and fmell three or four other liquors, of which we can difcover but very feeble veftiges in the other parts of thefe plants.

The fap or lymph, is a fimple fluid, without colour or fmell, and little different from water. It may be compared to the chyle in the animal œconomy, as may the roots which abforb and prepare it to the lacteals. It is purified, as the blood of animals, by perfpiration.

That the fap or lymph afcends from the root to the ftem, branches, leaves, and even the minuteft parts of the fructification, is paft a doubt. But whether the fap fo diffufed to the extremities of the plant ever returns, and there is in plants, a circulation of fap, analogous to that of the blood in animals, is a queftion which will probably never receive a fatisfactory anfwer, as the data required for its folution are exceedingly numerous, and almoft without our reach, and conjecture almoft the only evidence of which the fubject is fufceptible. The two hypothefes, however, of the circulation of the fap, and the perfpiration of plants, are very far from being oppofite in their nature and refult, as is generally

imagined;

imagined; but, on the contrary, are perfectly compatible with each other.

By the accurate experiments of M. Bonnet, it appears that the sap ascends, not by the bark, but by the fibres of the wood: and the curious observations of Grew, Duhamel, and other naturalists, render it highly probable that the fluid which ascends by the fibres of the wood, descends to the roots by the cortical fibres that are most contiguous to the wood. In support of this conclusion, it has been observed, that upon a transverse incision being made into the trunk of a tree, the juice, which is expended, or flows from the wound, proceeds in greater quantities from the upper lip, where the swelling likewise is much larger than below. It appears, however, that when two similar incisions are made, one at the top of the tree, and another near the root, the latter expends much more sap than the former. The return of the sap from the extremity of the branches to the roots being, by the result of such experiments, rendered somewhat more than probable, it remains that we establish the mode of its return, and ascertain its analogy, or want of analogy, to the circulation of the blood in animals. It is here that certainty fails us, and vague conjecture must supply its place. Before any thing satisfactory can be expected on this head, we must previously determine, whether the liquor which descends from the branches by the bark, be the same as that which ascends from the root by the wood; and next discover the anastomoses or joinings of both series of vessels, in other words, the communication betwixt the cortical and ligneous fibres:—a *desideratum* which, if we may reason by analogy, will not be obtained without the utmost difficulty, since, with the assistance of injections, we have not yet been able to discover but obscurely the anastamoses of the veins and arteries in the animal system.

In spring, the sap is found in greatest abundance, and then the bark is easily detached from the wood. On the contrary, when the sap-season is past, the bark is found closely applied, and, as it were, glued to the wood. The leaves contribute greatly both to the abundance and motion of

of the ſap. If a tree, when high in ſap, is diveſted of its leaves, the bark, in a few days, will adhere as cloſely to the wood as in winter.

The other ſort of fluid contained in plants is denominated the proper juice, and is analogous to the blood in animals. It is a compound liquor, and is eaſily diſtinguiſhed by its colour, ſmell, or ſubſtance from the lymph or ſap.

This fluid is either green, as in periwinkle; white, as in ſpurge, fig-tree, and dog's-bane; yellow, as in celandine; red, as in log-wood, and dragon's-blood; mucilaginous or gummy, as in the jujube and mallow-tribes; or reſinous, as in the cone-bearing plants. It is from this variety in colour and ſubſtance, that the liquor in queſtion is called the proper juice; each ſpecies of plant being ſuppoſed to contain a fluid which is proper and peculiar to it.

In this blood or proper juice reſide the ſmell, taſte, and virtue of the plants. In fact, thoſe plants poſſeſs little virtue, in which there is either a ſuperabundance of ſap, or a poverty of blood. It is the juice which flows from the poppy that is narcotick; the corroſive quality of celandine and ſpurge reſides in the ſame fluid; the purgative virtue of jalap in its reſin. Barks poſſeſs more virtue than woods, becauſe the blood-veſſels of the former are thicker and larger than thoſe of the latter.

The blood or proper juice is contained in tubes which are larger than the lymphatic or ſap-veſſels, and although diffuſed through the whole ſubſtance of the plant, are collected in greater abundance in the bark. In fir-trees, the turpentine, which is the proper juice, is amaſſed in the parenchymatous ſubſtance, immediately under the epidermis or ſkin of the bark: in juniper, the ſandarac is collected betwixt the bark and the wood: in the larch-tree, the turpentine which it produces is accumulated in the body of the wood: in pine, it exſudes from the bark, from betwixt the wood and bark, from the wood itſelf, and from the pith.

For further particulars on this intereſting phyſiological ſubject, the reader is referred to M. Duhamel's Traité des Arbres,

Arbres, Dr. Grew's Anatomy of Plants, and the works of the ingenious M. Bonnet of Geneva.

SYNGENESIA (συν, together, and γενεσις, generation) the name of the nineteenth claſs in Linnæus's Sexual Method, conſiſting of plants in which the *anthers* or male organs of generation are united into a cylinder, the filaments on which they are ſupported being ſeparate and diſtinct.

This claſs contains the numerous tribe of compound flowers, whoſe general characters were enumerated under the article COMPOSITUS *flos*.

The orders or ſecondary diviſions of the claſs *Syngeneſia* ariſe from the different modes of intercommunication of the florets or leſſer partial flowers contained within the common calyx. This intercommunication, which Linnæus, from a love to analogies, terms the POLYGAMY OF FLOWERS, admits of the four following caſes.

I. The florets all hermaphrodite.

II. Hermaphrodites and females.

III. Hermaphrodites and florets of no ſex or neuter.

IV. Males and females.

When the florets are all hermaphrodite, as in the firſt caſe, the polygamy is ſaid to be equal, and the compound flowers ſo characterized are referred to the order *Polygamia Æqualis*, expreſſive of that circumſtance. This order contains the ſemifloſcular, and many of the floſcular, compound flowers of Tournefort. Among the former are dandelion, ſow-thiſtle, lettuce, ſuccory, goat's beard, nipple-wort, and hawk-weed; among the latter, burdock, ſaw-wort, thiſtle, artichoke, hemp-agrimony, goldylocks, and Lavender-cotton. This order contains no radiated flowers.

In the ſecond caſe, the florets in the centre or diſk are hermaphrodite; thoſe of the circumference, margin, or radius, female, that is, want the *ſtamina* or male organs. This ſort of intercommunication Linnæus terms *polygamia ſuperflua*, uſeleſs or ſuperfluous polygamy, becauſe the impregnation of the female florets in the circumference is unneceſſary, the fructification being perfected in thoſe of the centre. The flowers which are referred to this order are either

either flofcular, that is, compofed entirely of hollow florets; or radiated. Among the former are tanfy, wormwood, cud-weed, and flower-everlafting; among the latter, colt's-foot, groundfel, after, golden-rod, elecampane, daify, feverfew, milfoil, and African marigold.

In the third cafe, the hollow florets in the centre are hermaphrodite; the flat ones in the circumference, neuter, that is, want both male and female organs. This kind of polygamy is termed properly enough *ineffectual (polygamia fruftranea)* as the florets in the circumference being of no fex are totally ineffectual to the fructification. The order in queftion contains only fix genera: viz. fun-flower, dwarf-fun-flower, tickfeeded fun-flower, *gorteria*, *ofmites*, and centaury.

In the laft cafe, the florets of the centre or difk are male, and thofe of the circumference, female. This fort of polygamy is termed, *neceffary (polygamia neceffaria)* becaufe none of the florets being hermaphrodite, the prefence of male and female florets is abfolutely neceffary for perfecting the fructification. Marigold, arctotis, African ragwort, hard-feeded chryfanthemum, cotton-weed, *(filago)* and baftard cud-weed, furnifh examples. The flowers of this order are moftly radiated.

Befides the four orders juft mentioned, the clafs *fyngenefia* contains two others. Thefe are *polygamia fegregata*, and *monogamia*.

The firft derives its name from the florets being *feparated* from one another by means of partial flower-cups, which fupport one or more florets, and are placed within the common calyx. This order furnifhes no diftinct cafe of polygamy, and is, in fact, only a modification of the firft cafe; the florets fo feparated being all hermaphrodite, except in the genus *fphæranthus*, which having hermaphrodite florets in the centre, and female florets in the margin, is referred to that particular fpecies of polygamy which we denominated *fuperfluous*.

The genera in this order are five in number; viz. elephant's-foot, globe-flower, globe-thiftle, *gundelia*, and baftard

Ethiopian elichryſum. The firſt has four florets in each partial flower-cup; the ſecond has an indefinite number; the three laſt only one.

The order *monogamia* contains ſimple flowers. The term ſignifies a ſingle marriage, and is placed in direct oppoſition to the polygamy or intercommunication of florets, which ſo conſpicuouſly characterizes the other orders. In fact, balſam, violet, cardinal flower, and the other plants of this order, agree with the compound flowers in ſcarce a ſingle circumſtance, ſave the claſſical character, the union of the *anthers* or tops of the *ſtamina*:—a circumſtance which, whilſt it undeniably confutes Linnæus's aſſertion, that, in that union conſiſts the eſſence of a compound flower, ſerves likewiſe to demonſtrate the imperfection of his artificial character. Former botaniſts had ſought for the eſſential character of this numerous tribe of plants in the common calyx and common receptacle. Both theſe Linnæus rejects as inadequate, and in their place ſubſtitutes the union of the *anthers* and ſituation of the ſeeds. That union, we have ſeen, is not peculiar to compound flowers; it is to be found in violet, balſam, cardinal-flower, ſheep-ſcabious, and ſome other flowers, confeſſedly ſimple. To this it will be anſwered, that Linnæus's aſſertion is different from what I have repreſented it: that the author in queſtion, ſo far from affirming that the union of the *anthers* conſtitutes, of itſelf, the eſſence of compound flowers, has combined that circumſtance with the ſituation of the ſeeds, and declared that the eſſence of a compound flower conſiſts in having the anthers united into a cylinder, and a ſingle ſeed placed under each floret. This argument is plauſible, but not ſolid, for unluckily three of the genera of the order *monogamia*, viz. Strumpfia, ſeriphium, and corymbium, beſides the united anthers, have likewiſe a ſingle ſeed placed under the receptacle of the flower, and yet the order *monogamia* contains ſimple flowers only. The fact is, that compound flowers are ſo remarkably different in their port and external appearance from thoſe termed ſimple, that it is unneceſſary to ſeek for an eſſential character where there is no danger of confuſion.

Aggregate and compound flowers have indeed a greater conformity in point of habit; yet a ſuperficial attention only is requiſite to diſcover very material differences in their ſtructure.

As the excellence of the artificial character is conſtituted by its approximation to the natural, it is evident that a character, which arranges together things that are abſolutely heterogeneous, and poſſeſs no natural relations, is imperfect and erroneous. Compound flowers are confeſſedly a natural tribe of plants. Simple flowers poſſeſs no relations in common with them, that can juſtify a junction. A character, therefore, which, like that of Linnæus, blends ſimple and compound flowers promiſcuouſly together, offers a manifeſt violence to Nature, by forcibly tearing many genera of plants from their proper place, and incorporating them with others which are of a different and even oppoſite nature. In fact, in all the numerous ſyſtems in botany, there is not a ſingle character, which wounds Nature ſo cruelly as that of Linnæus, in the inſtance juſt given.

By an ingenious writer, Dr. Barton of Philadelphia, who has lately publiſhed an Elementary Treatiſe on Botany, the author of the preſent work, which the learned Profeſſor has honoured with repeated marks of peculiar notice and diſtinction, is, notwithſtanding, under the article before us, charged with an inconſiſtent departure from his uſual tenets, for aſſerting, that "the genus *Kuhnia*, although very nearly allied to hemp-agrimony, and indeed, in every other reſpect, like a compound flower, is *very properly* referred by Linnæus to a claſs containing ſimple flowers, *(pentandria)* becauſe the anthers are ſeparate and diſtinct." *Vide* COMPOSITUS *flos*. As there is no imputation which, in matters of ſcience, it becomes a man more ſeduouſly to avoid, than that of inconſiſtency, ſo neither is there any which, when charged without due conſideration, he ought with greater ſolicitude to repel. Dr.

Barton's

Barton's mifconception in the inftance juft mentioned, (for a mifconception, I truft, I fhall evidently prove it) may have probably arifen from his overlooking a diftinction which, in appreciating the merits of any particular fyftem, that of Linnæus for example, it is ever neceffary to make between the precife portion of approbation which may be juftly claimed by its founder, on account of the degree of ftrictnefs in his adherence to the principles of his Method, be thofe principles what they may, and that which belongs to him from the comparative excellence of the artificial character, which is always in the direct ratio of its nearer approach to the order of nature.—In this view, as is manifeft, the fame writer may, in one refpect, be the object of merited cenfure, and in another, that of equally merited applaufe. To the honour indeed of a rigidly uniform adherence to the principles of his fyftem, (an honour almoft exclufively due to Rivinus) Linnæus, it is true, has but flender pretenfions: and fome very remarkable deviations from the fimplicity of his plan have been occafionally enumerated in the courfe of this work. In general, however, he has the praife of uniformity: and, as he profeffes not in his Sexual Method to inveftigate the Order of Nature, it can be no reproach, that, in order to conduct the learner with greater facility to the knowledge of plants, which is the principal bufinefs of an artificial character, he has, with the exceptions juft mentioned, commonly adhered to the principles of his method, facrificing to utility even nature itfelf, by declining to arrange certain genera under claffes to which, however connected with their congeners by external habit, and other natural affinities, the mere novice in botany, for whofe ufe every artificial fyftem is intended, could not, for want of the claffical character, be ever led to refer them. I conceive myfelf, therefore, perfectly juftified, and ftrictly confiftent with the general tenor of the doctrines of the Botanical Dictionary, and my other works refpecting the comparative excellence of the artificial character of Linnæus, as explained above, (doctrines which I have ever maintained, and yet fee no reafon to retract) when I affert that Linnæus

has

has with the utmoſt propriety referred the genus *Kuhnia*, which, in a *Natural* Method would, no doubt, without any effort, from its general appearance, have arranged itſelf with the *compound flowers*, to the claſs *pentandria* of his *artificial* method, containing *ſimple flowers*, in which it with equal facility aſſumes its place, bearing as it does five ſtamina or male organs of fecundation, ſeparate both in their anthers and filaments, the ſpecial diſtinctive character of the claſs. For the ſame reaſon, Linnæus is not to be blamed, but defended, for placing violet, balſam, and other ſimple flowers, with the compound, in the claſs ſyngeneſia conſidered as part of an *artificial* method, becauſe they as undoubtedly poſſeſs the claſſical character, the union of their five ſtamina by the anthers, as the compound flowers with which, however unnaturally, they are thus made to incorporate.—In ſhort, the genus *Kuhnia* could not, but with impropriety, have been transferred to the compound flowers in Linnæus's ſyſtem, conſtituted as the claſs *ſyngeneſia* which contains them now is; nor could the celebrated Swediſh Naturaliſt, without an entire alteration of the principles of his method, have removed violet and its congeners from the place which they now occupy therein. Still, however, much as we commend his general adherence to the artificial character which he has choſen, we deny its excellence, nay, regret that, in the formation of his ſyſtem, he ſhould have adopted it at all—a character which, by the ſuperſtructure of which it is the baſis, he himſelf has demonſtrated, could not be carried to its utmoſt extent, without, in a thouſand inſtances, producing junctions and ſeparations, which, doing violence to nature, muſt, for that reaſon, greatly diminiſh the value of the principle from which they proceed.

T.

TETRADYNAMIA (τεσσαρες, four, and δυναμις, power) four powers; the name of the fifteenth claſs in Linnæus's Sexual Syſtem, conſiſting of plants with hermaphrodite

dite flowers having six stamina, four of which are longer than the rest. It corresponds to the *siliquosæ* of Ray, and *cruciformes* of Tournefort, and, abating a single genus, *cleome*, is a true natural family, the particular characters of which are enumerated under the article *siliquosæ*, by which name Linnæus, after Ray, has distinguished these plants in his Fragments of a Natural Method. *Vide* SILIQUOSÆ.

The orders in the class *tetradynamia*, which are two in number, are likewise borrowed from the same author. Such as have a long pod, as stock, rocket, and ladies smock, being termed *siliquosæ*; those which have a short round one, as scurvy-grass, candy-tuft, and satin-flower, *siliculosæ*. I have observed the same distinction in subdividing the natural order *siliquosæ*.

In most species of bastard-mustard (cleome) the stamina are attached to a long pillar-shaped foot-stalk resembling a style, which supports the seed-bud; a circumstance which ought to have determined that genus to the class *gynandria* in the Sexual Method, upon the same principle, by which passion-flower and several other genera are made to arrange themselves under that class. The genus *cleome* indeed, whatever may be its pretensions to a place in the class alluded to, has certainly no right to that which it at present holds in the class *tetradynamia* of the same method; as, besides its wanting the classical artificial character, the inequality of the stamina, these male organs of generation are frequently more than six, the number to which plants of this class are restricted. In fact, *cleome* is among the most striking instances of Linnæus's deviation from his own principles; since scarce a circumstance, except the presence of what he calls nectariferous glands, which, by the way, are very seldom to be discovered even with glasses, can possibly connect it with the plants among which he has arranged it.

TETRAGYNIA (τεσσαρες, four; and γυνη, a woman,) the name of an order or secondary division in the 4th, 5th, 6th, 8th, and 13th classes in the Sexual System; consisting of plants, which, to the classic character, whatever it is, add the circumstance of having four styles or

 female

female organs. Herb-paris and grafs-of-Parnaffus, furnifh examples.

TETRANDRIA (τεσσαρες, four; and ανηρ, a man or hufband) the name of the fourth clafs in Linnæus's Sexual Syftem, confifting of plants with hermaphrodite flowers, which have four ftamina or male organs that are of equal length. In this laft circumftance confifts the main difference, according to Linnæus, between the plants of the clafs in queftion and thofe of the 14th clafs, *didynamia*, in which the four ftamina are of unequal length, two of them being longer than the other two.

The orders in this numerous clafs are three, founded upon the number of ftyles or female organs.

Scabious, teafel, barren-wort, the ftarry plants of Ray, and the greater number of genera in this clafs, have one ftyle.

Dodder, and hypecoum, have two ftyles.

Holly, and a few others, have four.

TETRANGIÆ (τεσσαρες, four; and αγγος, a veffel) the name of the eighteenth clafs in Boerhaave's Method, confifting of herbaceous plants having two feed-leaves, with a fingle capfule that is divided internally into four cells. It is exemplified in rue and thorn-apple.

THALAMUS, a bride-chamber; Vaillant's name for the *receptaculum* of Pontedera and Linnæus; the *fedes* of Ray; and *placenta* of Boerhaave.

Linnæus terms the calyx the *thalamus* of the flower.

THYRSUS, (properly a fpear wrapped about with ivy or bay-leaves, carried by the votaries of Bacchus at his feafts). In the modern nomenclature of botany, a mode of flowering refembling the cone of a pine. It is, fays Linnæus, a panicle contracted into an oval or egg-fhaped form. The lower foot-ftalks, which are longer, extend horizontally, whilft the upper ones are fhorter and mount vertically. Lilac and butter-burr furnifh examples.

TOMENTUM, fhort wool; a fpecies of hoary, or downy pubefcence, which covers the furface of many plants, particularly

particularly thoſe in the neighbourhood of the ſea, and ſuch as, in their native ſoil, are expoſed to the ravages of bleak and violent winds. The ſubſtance in queſtion conſiſts of a number of ſmall hairs, that are ſo cloſely interwoven as ſcarcely to be diſtinguiſhed by the naked eye; the white appearance ariſing from their aggregation and compact texture. *Ceraſtium tomentoſum*, medicago, and a ſpecies of marjoram and ſpeedwell, furniſh examples.

TRACHEÆ, air-veſſels of plants. *Vide* STRUCTURA VEGETABILIS.

TRIANDRIA, (τρεις, three; and ἀνηρ, a man or huſband) the name of the third claſs in Linnæus's Sexual Syſtem, conſiſting of plants with hermaphrodite flowers, which have three ſtamina or male organs.

The orders in this claſs are three, derived from the number of ſtyles or female organs.

Valerian, tamarind, and many others, have one ſtyle.

The graſſes, which conſtitute the ſecond order, have two ſtyles.

Eriocaulon, montia, and ſome others, have three.

TRIANGIÆ (τρεις, three; and ἀγγος, a veſſel) the name of the ſeventeenth claſs in Boerhaave's Method, conſiſting of herbaceous plants having two ſeed-leaves, with a ſingle capſule that is divided internally into three cells. It is exemplified in St. John's wort, violet, campanula, palma-chriſti, mercury, ſpurge, and cardinal-flower.

Tulip, narciſſus, iris, and ſeveral other plants which have their ſeed-veſſel divided into three cells, do not arrange themſelves under the claſs *triangiæ*, becauſe the ſeeds riſe with a ſingle leaf. Such plants conſtitute the twenty-eighth claſs, *bracteatæ*, of the ſame author.

TRICOCCÆ, (τρεις, three; and κοκκος, a grain) the name of the thirty-eighth order in Linnæus's Fragments of a Natural Method, conſiſting of plants with a ſingle three-cornered capſule, having three cells or internal diviſions, each containing a ſingle ſeed. The ſingle ſeed-veſſel of theſe plants is of a ſingular form, and reſembles three capſules,

 which

which adhere to one common foot-ſtalk as to a centre, but are divided externally into three pretty deep partitions.

Liſt of the Genera *contained in this Order.*

Linnæan Genera.	English Names.
Acalypha.	
Adelia.	
Andrachne, — —	Baſtard-orpine.
Buxus, — —	Box-tree.
Cambogia.	
Carica, — —	Papaw.
Cliffortia.	
Clutia.	
Cneorum, — —	Widow-wail.
Croton, — —	Baſtard-ricinus, Tallow-tree.
Cupania.	
Dalechampia.	
Euphorbia, — —	Burning thorny plant, ſpurge.
Excoecaria.	
Guettarda.	
Hernandia, — —	Jack-in-a-box.
Hippomane, — —	Manchineel-tree.
Hura, — —	Sand-box-tree.
Jatropha, — —	Caſſava, manihot.
Mercurialis, — —	Mercury.
Phyllanthus, — —	Sea-ſide laurel.
Plukenetia.	
Ricinus, — —	Palma-Chriſti.
Solandra.	
Sterculia.	
Tragia.	
Thryallis.	

This family not being completely natural does not fall to be particularly deſcribed in this place. The character expreſſed in the title is indeed a ſtriking one, and though the

the plants which poſſeſs it are not connected together by ſuch numerous relations as to form a true natural aſſemblage, yet are they by that circumſtance diſtinguiſhed from all other plants, with as great, perhaps greater facility than by any artificial character yet known. It is, however, to be obſerved, that all the genera of this order have not the ſtriking character juſt mentioned.

From the euphorbias, and ſeveral other genera of this order, flows by inciſion a corroſive liquor, which is white like milk.

The fruit of the manchineel tree is one of the moſt powerful cauſtics, and, if taken internally, never fails to prove mortal, if large quantities of oil are not immediately ſwallowed, to excite vomiting and ſheath the viſcera, before the cauſtic juice has operated. The tree bears a great reſemblance to the pear-tree. The bark is ſomewhat thicker, and filled with a viſcous corroſive milk. The wood under the alburnum is greyiſh, and beautifully marked with eyes of different tints or colours. The cauſtic and poiſonous quality is not peculiar to the fruit, being to be found alſo in the leaves, in the wood, in the milk of the bark, and even in its ſhade, by ſleeping under it.—The tree, which is commonly large, grows in the Weſt-Indies, on the bank of rivers, or on the ſea-ſhore, being rarely found at a diſtance from water. When it rains, one muſt be cautious of going under the tree for ſhelter, as the rain falling from its leaves on the hands, and other parts of the body, excites bliſters on the fleſh, as if boiling oil had fallen upon it, together with a very painful itching, which continues for a long time. If it falls into the eyes, it will endanger the eye-ſight; or if by chance one ſhould rub them with his hand moiſtened with this water, a conſiderable ſwelling is occaſioned, which from being red, becomes livid and full of pus.—The wood is no leſs dangerous to work, unleſs perfectly dry, and even its duſt or ſawings are poiſonous. Before it is touched, the workmen amaſs dry wood around its feet, ſet fire to it, and keep at a diſtance for fear of any bad conſequences from the ſmoke. When they think the fire has totally conſumed

its humidity, they apply the hatchet, taking care to have their face and arms covered with a towel or napkin, left the duft flying out of it, or the milky humidity which may have remained unevaporated, fhould affail their face, mouth, eyes, or hands. The fawyers ufe the fame precautions, as well as the turners who work it into tables, cabinets, and all forts of houfehold furniture, which are greatly efteemed for the uncommon beauty of the wood.—The Indians ufe the milk of the manchineel-tree to poifon their arrows. For this purpofe they make a cleft in the bark and infert the end of their arrows, which imbibes the liquor flowing out of the wound, that is white as milk, but thicker and more gluey. The arrows fo envenomed are fuffered to dry; and where they make a wound, poifon at the fame time.—Thofe who fleep under the manchineel-tree find themfelves, on awaking, prodigioufly fwelled, with a very violent megrim and a dangerous fever. By force of citron-juice and cordials, the venom is often, but with difficulty, extirpated.

A fpecies of euphorbia termed *efula*, if applied to any part of the body, produces a violent inflammation, which is foon fucceeded by a confiderable fwelling, that degenerates into a gangrene and proves mortal.

Sterculia (*ftercus*, dung) derives its name from the fœtid fmell of the wood, which is faid to refemble that of human excrements; whence the name of dirt-wood, by which it is known in the hot countries, where it is native.

The root of caffada, caffava, or manihot being divefted of its poifonous juices, ferves for bread to moft of the inhabitants of the Weft India iflands, whether black, white or red; that is, Negroes, Europeans, or Natives. The fhrub, fometimes called manioc, rifes feven or eight feet high, with a thin bark, that is grey, red, or violet, according to the different colours of the wood which it covers. The trunk and branches are filled with fmall prominences exhibiting the veftigia of the fallen leaves: for as the tree increafes in height, the leaves relinquifh the bottom of the branches, and are only to be found near the top. The wood is foft and brittle. The plant is better propagated by layers than from

feed;

ſeed; at leaſt, little of the root proper for eating is to be obtained by the latter method. The principal root produces ſuckers, in number from four to ſeven, and which differ in length and thickneſs, according to the age of the tree and goodneſs of the ſoil. The bark of the roots is like that of the trunk, grey, when the wood is grey; red, when the wood is red; white, when it is white; but the inſide or heart is always white, and of the conſiſtence of turnip. The roots of white manioc are ripe in eight months; thoſe of the other kinds require fourteen or eighteen months to attain their full ſize and maturity. When ripe they are plucked out of the earth by the tearing up of the whole tree, which never fails to be accompanied by the root; and if, in that operation, any of the off-ſets ſhould be ſeparated from the main root, which is eaſily obſerved, they take them up with a hoe. It requires no great force to pluck up theſe ſhrubs; for, beſides that the ſoil is of a ſoft nature, the roots do not penetrate very deeply into it. When plucked up, the Negroes deſtined for this work grate or raſp the bark with a blunt knife, as is done to turnips, and throw the roots into a tub full of water; they are then reduced to a powder or meal reſembling the coarſe ſawings of wood. This is effected by rubbing the root very forcibly againſt a copper file or grater, about fifteen or eighteen inches long, and ten or twelve broad, that is faſtened by ſmall nails upon a plank of timber, three feet and a half long, and one broad. The Negroe who files, puts one end of the plank into a wooden trough or tub, and holds the other againſt his ſtomach. At his ſide is a baſket, containing roots that are raſped, waſhed, and fit for being filed; one of theſe he takes in each hand, and paſſes it violently upon the file or grater till it is reduced to a rough powder.—All the roots being grated in this manner, they take the powder and put it into a preſs, with a view to ſqueeze out the juice, which is regarded as a very ſtrong poiſon, not only for men, but for beaſts alſo who drink of it, or chance to eat of theſe roots before the juice is expreſſed. It is remarkable, that animals which die in conſequence of having ſwallowed any quantity of this ſubſtance, have their breaſts prodigiouſly

 ſwelled,

ſwelled, without any viſible alteration on the noble parts. Some have hence argued that the juice in queſtion is not eſſentially a poiſon, but that poſſeſſing a ſuperfluity of nouriſhment, it proves an over-match to the digeſtive faculties, and thus proves mortal.—Beſides this ſuperabundance of nouriſhment, ſays Father Labat, a part of its malignity conſiſts in its coldneſs, which ſtops the circulation, benumbs the animal ſpirits, and at length cauſes death. Hence the beſt antidote againſt this poiſon is heat and violent motion. The patient, after ſwallowing large quantities of oil, to excite a nauſea and vomiting, is made to run as quick as he can, and drink plentifully of the ſtrongeſt ſpirits; in fine, every method is uſed to excite violent heat, to rouſe the ſpirits, and put the blood in motion.

Animals which have accuſtomed themſelves inſenſibly to the juice of manioc, feel no inconvience from the root of it, but rather the contrary. It is in this manner that the Turks, by a gradual and conſtant uſe, have rendered opium a harmleſs and even exhilarating medicine.

The juice of manioc loſes its malignity when heated. The natives of the Weſt-Indies, who uſe it in all their ſauces, feel no ſort of inconvenience from it, becauſe they never uſe it till after being boiled. Of the ſame juice they make ſtarch, by drying it in the ſun, where it becomes as white as ſnow, and is frequently made into cakes, which are as delicate as if made with the fineſt wheat-flour.

When the manioc is ſufficiently preſſed, they either make it into bread, called caſſada, or into flour for preſerving. For the firſt-mentioned purpoſe, they have a plate of iron, two feet broad, and half an inch thick; this they place upon a tripod, or on ſtones, and kindle a fire below it. When ſufficiently heated, ſo as not to admit of the touch, they lay on the whole ſurface about the thickneſs of three fingers of manioc, which has been previouſly preſſed and ſifted. The heap falls down in proportion as it roaſts; and the parts join and incorporate. This compreſſion and incorporation is aided by the perſon who roaſts ſlightly paſſing a piece of wood over the plate. When the ſide of the cake next the plate

plate is sufficiently done, that is, adheres, and the colour, formerly very white, becomes red, it is turned, and the other side allowed to roast till the same symptoms appear. When roasted, it is laid in the sun for two or three hours, with a view to dissipate any poisonous humidity, which may still lurk in the root under this new form.

The inside of cassada is as white as snow, the sides of a pale gold colour. The substance, which is very nourishing, and of easy digestion, may be preserved seven or eight months, or more, provided it is kept dry, and sometimes exposed to the sun. When dipped in water, or put in soup, cassada swells up to a great height, which seems to prove its great abundance in substance.

The other mode of preparation, however, is most common, as being more convenient for preserving, distributing to the Negroes, and transporting from place to place. The manioc, in this case, is put into a pan or stove that is but slightly heated, where it is continually turned, like coffee-beans, with a small wooden instrument contrived for that purpose. This motion prevents it from sticking to the pan; so that, when dried and roasted, it has the appearance of thick red grains of salt. This mode of preparation is much more expeditious than the former. When dried, it is put into granaries, where it may be preserved whole years, if kept dry, or put into a stove every six months.

This substance may be eaten quite dry, as crumbled bread, or as the Turks eat roasted rice. When moistened, it swells prodigiously.

This latter method of preparing manioc is never practised by the natives; who use only cassada, which they prepare once every day or oftener, as occasion requires; for they eat it quite hot, as being then more delicate and agreeable to the taste. Before their intercourse with the Europeans had procured them iron plates, they made their cassada upon large flat stones, whose thickness they adjusted to that purpose. In default of copper files or graters, they made use

of

of a plank of wood, in which were fixed very ſmall ſharp bits of pebbles.

One ſpecies of manioc is ſaid to be exempt from the poiſonous quality poſſeſſed by the juice of the others. It is called camanioc, that is, chief of maniocs; in fact, its wood, leaves, and roots are larger and thicker than the others, and it is eaten without danger, or any precaution: but as it requires a longer time to attain maturity, and the roots yield much leſs meal, becauſe lighter and more ſpungy, it is generally neglected.

The ſmall bits of manioc, which have eſcaped the grater, and the clods which have not paſſed the ſieve, are not uſeleſs. They are dried in the ſtove, after the flour is roaſted, and then pounded in a mortar to a fine white powder, with which they make ſoup. It is likewiſe uſed for making a kind of thick coarſe caſſada, which is roaſted till almoſt burnt; of this, fermented with melaſſes and Weſt-India potatoes, they prepare a much eſteemed beverage, called ouycou. This liquor, the favourite drink of the natives, is ſometimes made extremely ſtrong, eſpecially on any great occaſion, as a feaſt; with this they get intoxicated, and, remembering their old quarrels, wound and murder one another. Such of the inhabitants and workmen as have not wine, drink ouycou. It is of a red colour, ſtrong, nouriſhing, refreſhing, and eaſily inebriates the inhabitants, who ſoon accuſtom themſelves to it as eaſily as beer.

The leaves of manioc are uſed in both Indies as thoſe of ſpinach are with us.

Box-wood being extremely hard is uſed for ſeveral purpoſes, and may properly enough be ſubſtituted in default of ebony, the yellow alburnum of which it perfectly reſembles. Employed in medicine, box-wood is ſudorific.

The Negroes of Senegal uſe from three to five entire ſeeds of *iatropha curcas* for purging the inteſtines; uſed in greater quantity, theſe ſeeds would prove mortal. It appears too that the purgative virtue reſides only in the radicle or *punctum vitæ* of the ſeeds; for the Negroes eat with equal

impunity

impunity and avidity large quantities of these seeds, after the radicle has been extracted.

Papaw, or popo-tree, the *carica papaya* of Linnæus, is male and female upon different roots: the flowers of the former being white, of the latter yellowish. The tender buds of these last are preserved into sweet-meats; and the long mango popo, which is said to be little inferior to an East-India mango, into pickles. When nearly ripe the fruits are likewise boiled and eaten with any kind of flesh-meat, care being taken previously to cleanse them of the milky corrosive juice contained in them, which is of so penetrating a nature, says Hughes*, that, if the unripe fruit, when unpeeled, is boiled with the toughest old salt meat, it will soon make it soft and tender; and, if hogs are for any considerable time fed with the raw fruit, it wears off all the mucous slimy matter which covers the inside of the guts, and would, in time, if not prevented by a change of food, entirely lacerate them. This juice, continues the same author, is sometimes made use of to cure ring-worms and such cutaneous eruptions.

The kernels of sand-box tree are said to be purgative, and sometimes emetic. The use to which the capsule, generally cut into fifteen or sixteen divisions, is applied, suggested the name given to this curious and beautiful exotic.

The leaves and tender buds of physic-nut tree, a species of *croton*, emit a milky juice, which is said to be applied to green wounds with success. The nut, when ripe, yields a considerable quantity of oil, a spoonful of which swallowed when fresh is of a purgative quality, and deemed proper for abating swellings in dropsical disorders.

The bark of *cascarilla*, another species of the same genus, is used successfully by the natives of Senegal in tertian fevers that are accompanied with a diarrhœa.

From the berries of the ricinus, or *palma-christi*, is extracted an oil which the natives of the West Indies use in

* Natural History of Barbadoes.

their

their ſoups. This oil is generally known in thoſe countries by the name of caſtor oil.

The Negroes of Senegal uſe externally with ſucceſs the leaves of *palma chriſti* in megrims and inflammations of the eyes.

The wind blowing into the cavities of the capſules of *hernandia ſonora* makes a very ſonorous whiſtling noiſe; whence the name of jack-in-a-box, by which this plant is generally known.

Croton tinctorium yields by expreſſion a greeniſh juice, which, by means of the volatile alkali of urine, dyes ſtuffs of a blue colour.

TRIHILATÆ, (*tres*, three, and *hilum*, an external mark on the ſeed); the name of the twenty-third claſs in Linnæus's Fragments of a Natural Method, conſiſting of plants with three ſeeds, which are marked diſtinctly with an external cicatrix or ſcar where they were faſtened within the *pericarpium*.

Liſt of the Genera *contained in this Order.*

	Linnæan Genera.		English Names.
α	*Melia*,	— —	Bead-tree.
	Trichilia.		
β	*Acer*,	— —	Maple.
	Æſculus,	— —	Horſe-cheſnut.
	Baniſteria.		
	Malpighia,	— —	Barbadoes-cherry.
	Triopteris.		
γ	*Cardioſpermum*,	—	Heart-ſeed, or heart-pea.
	Paullinia.		
	Sapindus,	— —	Soap-berry.
	Staphylæa,	— —	Bladder-nut.
	Tropæolum,	— —	Indian creſs.

TRIPETALOIDEÆ, (*tres*, three; and *petalum*, a petal) the

the name of the fifth claſs in Linnæus's Fragments of a Natural Method, conſiſting of plants with three petals.

Liſt of the Genera *contained in this Order.*

Linnæan Genera.			*Engliſh Names.*
Aliſma,	—	—	Water-plantain.
Aphyllanthes.			
Butomus,	—	—	Flowering-ruſh, or water-gladiolus.
Calamus.			
Flagellaria.			
Juncus,	—	—	Ruſh.
Sagittaria,	—	—	Arrow-head.
Scheuchzeria,	—	—	Leſſer flowering-ruſh.
Triglochin,	—	—	Arrow-headed graſs.

Theſe plants have no very ſtriking characters, and are nearly allied to the graſſes. All the genera have not the circumſtance expreſſed in the title.

TRUNCUS, the trunk; that part of the herb which ariſes immediately from the root, and is terminated by the fructification; the leaves, buds, and auxiliary parts of the herb, not entering into its deſcription.

The different ſpecies of trunks enumerated by Linnæus are as follows:

CAULIS.
CULMUS.
SCAPUS.
FRONS.

Each of theſe terms is particularly explained in its proper place.

To this article, as the moſt ſuitable for that purpoſe, I formerly referred the reader for ſome general remarks on the mutual relations which ſubſiſt betwixt roots and ſtems.

Theſe principal parts of the plant are unfolded, branch, and ſubdivide almoſt in the ſame manner: the extent and force

force of the one being always too in proportion to the ſame qualities in the other. A ſhrub which puts out ſmall branches, has univerſally ſlender roots. The ſame tree planted in an eſpalier, where its growth is cramped, or it is pruned very cloſe, produces roots that are leſs numerous, leſs ſtrong, and leſs extenſive, than if cultivated as a ſtandard in full air. Hence the impracticability of extending the roots of a tree by lopping its branches. A fruit-tree, by ſuch an operation, will produce more fruit, becauſe moſt of the nouriſhment which went to theſe lopped branches, is now concentrated in the fruit; but its growth will be retarded, and its life rendered ſhorter.

Further, ſtems as well as roots are lengthened by their extremities, which ceaſe to grow upon being cut. Both, in conſequence, form new productions: the ſtems put forth lateral branches; the roots, lateral roots; whence it follows, that to cut the extremities of the ſtem and branches, is the proper way to form the heads of trees; and, in like manner, to cut the extremity of long perpendicular roots, is an excellent method to form beautiful and vigorous trees; for the perpendicular root being cut, the lateral ramifications, or ſide-roots, multiply; and theſe being placed nearer the ſurface of the earth, find a greater ſupply of nouriſhing juices in their progreſs.

Again, the ſtem is provided with ſeveral buds of branches, and the root with ſeveral ſuckers, or buds of roots. They may likewiſe be compared in their organization or internal ſtructure, which, in both, is nearly the ſame, unleſs that the epidermis or ſcarf-ſkin of the root is thicker, and the colours, internally, ſtronger and more lively.

In ſhort, except in their direction, which is univerſally oppoſite, ſtems and roots ſeem to bear a remarkable analogy to one another, ſo that, as Linnæus obſerves, ſtems may be conſidered as roots above ground.

TUBA, a trumpet. Vaillant's name for the *ſtylus* of Boerhaave and Linnæus; the *piſtillum* of Tournefort. *Vide* STYLUS.

TUBULOSUS *flos*, a ſpecies of compound flower ſo termed

termed by Linnæus, all the florets or partial flowers of which are funnel-ſhaped, and nearly equal.

Of this kind are thiſtle, burdock, artichoke, hemp-agrimony, tanſy, cud-weed, and bidens.

The flowers in queſtion correſpond to the *floſculoſi* of Tournefort and Pontedera, the *compoſiti regulares* of Rivinus, the *compoſiti uniformes* of Chriſtian Knaut, and the *capitatæ* of Boerhaave and Ray.

TUBUS, the tube, or lower hollow part of a flower with one petal; oppoſed to *unguis*, the claw of a polypetalous flower.

V.

VAGÆ. Under this name Linnæus arranges a number of genera, which remain vague and undetermined, as, for want of uniform relations, they cannot conſtitute of themſelves a true natural aſſemblage, nor conſequently be referred to any of his Natural Orders.

In the Fragments of his Natural Method, they form an Appendix to the Scheme, by the name of *Dubii etiamnum Ordinis.*

VALVULA, a little valve, or opening; the external diviſions of a dry ſeed-veſſel, as a capſule, or pod, which ſplit when the ſeeds are ripe for the purpoſe of diſſemination.

The openings in queſtion are either two in number, as in celandine, cabbage, and the pea-bloom flowers; three, as in violet, and Greek valerian; four, as in tree-primroſe, and French-willow herb: or five, as in flax, lime-tree, and Syrian mallow.

VARIETAS, a variety; a plant changed by ſome accidental cauſe, which being removed, the variety or mutation diſappears, and the ſpecies is reſtored. As many plants of different form and appearance as are produced from ſeed of the ſame ſpecies, are to be regarded as genuine varieties, and in

in all cafes to be diftinguifhed with great accuracy from the fpecies.

In the form and difpofition of the parts of each individual of the fame fpecies, there exifts, in general, a conftant uniformity. Different caufes, however, as culture, climate, expofure, age, difeafes, luxuriance or poverty of nourifhment, contufions, and other circumftances, produce monftrous appearances and accidental varieties in the parts of plants.

In treating of luxuriance in flowers, we obferved that a fuperabundance of nourifhment gives rife to the numerous tribe of double and prolific flowers. The fame caufe gives to all the parts of the plant a thicknefs and extent, by no means natural to them. Hence, likewife, the prodigious multiplication of the leaves of fome plants, which increafe to fuch a degree, as frequently to injure the flower and fruit.

The leaves of young trees and of new fhoots are much larger, and lefs cut and ramified than thofe of a grown tree of the fame fpecies. In holly, the leaves lofe their prickles when the tree waxes old.

The lower leaves of aquatic plants, as crow-foot and water-drop-wort, are frequently finely cut like hairs, whilft thofe above are of a different form. Plants of the fame fpecies that grow in another foil, have no diverfity in the form of their upper and under leaves. Again, in mountainous plants, the lower leaves are generally more entire; the upper ones more divided. Burnet faxifrage, anife and coriander, furnifh examples.

The feeds or grains of many graffes, particularly of rye, are fometimes prolonged into a horny appearance of a fungous fubftance, that is pretty hard, and, as it were, cartilaginous. Some of thefe monftrous productions are more than two inches long. Rye difeafed in this manner is frequently attended with fatal confequences to fuch as eat of the bread prepared from it. The fame appearance has been obferved in *gramen aquaticum fluitans*, and carex. This difeafe,

diſeaſe, termed by Linnæus *clavus*, is common in moiſt years and rainy ſeaſons, and ſeems to be principally owing to a defect of perſpiration.

The flowers and ſeeds of many of the eſculent graſſes, and of ſome other plants, are frequently reduced into a black powder. This appearance has been particularly obſerved in wheat, rye, barley, oats, perſicaria, marſh ſcorzonera, goat's-beard, ſoap-wort, and ſome of the lychnis, pink, and chick-weed tribe. In the greater number, the diſeaſe, when it attacks the flower, begins by the receptacle under the form of ſmall black points, which inſenſibly reach the other parts of the flower, as the flower-cup, petals, and ſtamina, without attacking the piſtil, or female organ, which, however, commonly proves abortive.

The diſeaſe termed *uſtilago*, or burning, differs from that juſt mentioned, in that it is contagious and hereditary; the ſeeds being the only parts that are affected by it. It has been diſcovered in the ſame ſpecies of graſſes as the former, but more abundantly on Indian millet. M. Aymen, a French academician, attributes both theſe diſeaſes to an internal fault in the ſap.

The upper ſurface of the leaves of ſome plants, particularly of hop, melon, dead-nettle, hedge-nettle, maple, and gromwell, is ſubject to be covered with a white appearance, which makes the leaves ſeem thicker, more weighty, and more opaque. Plants which are attacked by this diſeaſe, termed by botaniſts *eryſiphe*, rarely produce any fruit; or, if they do, it is badly formed, and has a crude diſagreeable taſte.

On the under ſurface of the leaves of ladies mantle, and a ſpecies of euphorbia with cypreſs leaves, is occaſionally diſperſed a yellowiſh duſt, which, from its reſemblance to ruſty iron, has occaſioned the name of *rubigo*, or ruſt, to be given to this particular diſeaſe, which, like *clavus*, and ſome others, appears to proceed from a defect of perſpiration.

White ſpots are frequently obſerved on ſome leaves, which thence appear empty, and, as it were, tranſparent. It is occaſioned by the influence of a burning ſun acting

 upon

upon them when very much moiſtened, either in conſequence of continued rain, or a ſtrong dew. When all the leaves are attacked with this diſeaſe, which has obtained the name of *candor*, that is, the whites, the plant commonly periſhes a few days after.

Certain plants of warm climates are ſubject to loſe their petals, when cultivated in cold countries, and that, even when the fruit arrives at maturity. For particulars on this ſubject, the reader is referred to the article MUTILUS *flos*.

Plants which grow in the ſhade, or in places that are deprived of a proper current of air, are apt to become meagre, and, without taking the conſiſtence which is ſuitable, to periſh before they have produced any fruit. Experiments demonſtrate, that the feebleneſs of ſuch plants proceeds leſs from a defect of heat than from a privation of light.

Other cauſes alter the colour of leaves, and occaſionally produce the beautifully variegated leaves ſo much in requeſt among gardeners. Some leaves are ſubject to aſſume a deep red; this is particularly the caſe with herb Robert, a ſpecies of crane's-bill.

The branches of aſh and willow are frequently flattened in ſeveral irregular ways. This is ſuppoſed to be in conſequence of two buds being naturally grafted in each other, before the unfolding of the branch. Two leaves, or two fruits engrafted in this manner, produce other monſtrous appearances. By means of artificial grafting, we may, in like manner, vary the form of leaves, ſtems, flowers and fruit.

Laſtly, certain inſects depoſiting their eggs under the bark of the leaves and ſtems of ſeveral plants, occaſion an extravaſation of the ſap, and hence give birth to certain ſingular productions, which in different bodies reſemble either nuts, muſhrooms, or ſpunges, and are either round or long, hard or ſoft, covered with leaves, or guarded with briſtly threads.

Such are the galls of oak which enter into the compoſition of ink; thoſe of lime, ciſtus, ground-ivy, a ſpecies of hawk-weed, the aſpen-tree, and ſeveral ſpecies of willow. Thoſe of a ſpecies of ſage called ſalvia baccifera, are ſold in the

the markets of the Levant by the name of ſage-apples. Tournefort relates that they are round, nine or ten lines in diameter, of the colour of aſhes, cottony, with a white pulp that is ſomewhat tranſparent, ſweet, and of a very agreeable taſte. Thoſe of the ſcarlet oak are two lines in diameter. The ſubſtance is very red, and being dried, is the kermes, or ſcarlet-paſtel, ſo well known by the dyers.

Of the ſame nature with the galls juſt mentioned are thoſe ſtrange bodies covered with green, red, or yellow fibres, termed bedeguar, which a fly of the ſame kind produces upon the wild-roſe. Such are likewiſe the ſmall bladders on the ſurface of elm-leaves, which are filled with gnats, and with an aſtringent balmy liquor that is an excellent vulnerary.

Such are the principal accidents to which the parts of plants are ſubject, and which give riſe to the numerous tribe of varieties in the vegetable kingdom.

VEPRECULÆ, (diminutive from *vepres*, a briar, or bramble;) the name of the thirty-firſt order in Linnæus's Fragments of a Natural Method, conſiſting of the following genera, which do not conſtitute a true natural aſſemblage.

Linnæan Genera.		*Engliſh Names.*
Dais.		
Daphne,	— —	Mezereon, or ſpurge-laurel.
Dirca,	— —	Leather-wood.
Gnidia.		
Lachnæa.		
Paſſerina,	— —	Sparrow-wort.
Quiſqualis.		
Stellera,	— —	German groundſel, or Tragus's ſparrow-wort.
Thyſium.		

VERNATIO (a renewing, or growing again, from *ver*, the ſpring;—foliation or leafing). By this general term, inſtead of *foliatio*, which he had employed in his earlier works, Linnæus has expreſſed in the later editions the curi-

ous manner in which the leaves are folded or wrapped up in their buds.—In this respect, leaves are

Conduplicata, doubled together, as in oak, ash, beech, rose, bramble, and most of the plants of the class *Diadelphia* of Linnæus.

Convoluta, rolled together like a scroll, as in aster, golden-rod, comfrey, and most of the grasses.

Equitantia, riding on one another, as in iris, acorus, *carex*, *poa*, and some other grasses.

Involuta, rolled spirally inwards on both sides, as in pear, apple, honey-suckle, violet, hop, and nettle.

Revoluta, rolled backwards on both sides, as in fox-glove, dock, pellitory, groundsel, and colt's foot.

Obvoluta, rolled up against one another, as in valerian, teasel, scabious, pink and sage.

Imbricata, laid over one another like tiles, as in privet, St. John's wort, and Greek valerian.

Circinalia, rolled spirally downwards, as in the ferns, and some palms.

Plicata, plaited, as in mallow, vine, passion-flower, and alder-tree, or

Reclinata, folded back towards the footstalk, as in anemone and monk's hood.

By actually dissecting the buds of these plants, which are familiar to most, and likewise easily to be found, for which reason I have preferred them as examples, the learner in botany will acquire a far more accurate knowledge of the full force and meaning of the above-mentioned terms of foliation, than by any definition or description, however exact and elaborate.

VERTICILLATÆ, (from *verticillus*; *vide infra*) the name of a class in Ray's and Boerhaave's Methods, consisting of herbaceous vegetables having four naked seeds, and the flowers placed in whorls round the stalk. The term is synonymous to the *labiati*, or lipped-flowers of Tournefort, and is exemplified in mint, thyme, and savory.

VERTICILLATÆ is also the name of the forty-second order

order in Linnæus's Fragments of a Natural Method, confifting of plants which anfwer the above defcription.

Lift of the Genera *contained in this Natural Order.*

Linnæan Genera.		English Names.
Ajuga,	— —	Bugle.
Amethyftea.		
Ballota,	— —	Black hore-hound.
Betonica,	— —	Betony.
Cleonia.		
Clinopodium,	— —	Field-bafil.
Cunila.		
Dracocephalum,	— —	Dragon's head.
Galeopfis,	— —	Hedge-nettle.
Glechoma,	— —	Ground-ivy.
Horminum,	— —	Pyrenæan clary.
Hyffopus,	— —	Hyffop.
Lamium,	— —	Dead nettle.
Lavandula,	— —	Lavender.
Leonurus,	— —	Lion's-tail.
Lycopus,	— —	Water hore-hound.
Marrubium,	— —	Hore-hound.
Meliffa,	— —	Balm.
Melittis,	— —	Baftard balm.
Mentha,	— —	Mint.
Moluccella,	— —	Molucca balm.
Monarda.		
Nepeta,	— —	Cat-mint, or nep.
Ocymum,	— —	Bafil.
Origanum,	— —	Marjoram.
Orvala.		
Phlomis,	— —	Sage-tree, or Jerufalem-fage.
Prafium,	— —	Shrubby hedge-nettle.
Prunella,	— —	Self-heal.
Rofmarinus,	— —	Rofemary.
Salvia,	— —	Sage.

Linnæan Genera.			*English Names,*
Satureia,	—	—	Savory.
Scutellaria,	—	—	Skull-cap.
Sideritis,	—	—	Iron-wort.
Stachys,	—	—	Base hore-hound.
Teucrium,	—	—	Germander.
Thymbra,	—	—	Mountain-hyssop.
Thymus,	—	—	Thyme.
Trichostema.			
Zeziphora,	—	—	Syrian field basil.

Habit and Structure of the Plants of this Order.

This order, termed by Tournefort *labiati*, or lipped-flowers, from the unequal and irregular divisions of the petal, which commonly resemble the two lips of an animal, contains annual and perennial herbs, and shrubby plants, some of which retain their green leaves during the winter.

The ROOTS are branched and fibrous.

The STEMS are round when old, square, when young; as are likewise the young branches which stand opposite.

The LEAVES are opposite, and in the greater number covered with transparent points. Those which are placed next the flower generally differ from the stem-leaves.

In the greater number of plants of this order, the leaves are supported upon a long cylindrical foot-stalk that is furrowed above. Some, however, as dead-nettle and bugle, have the leaves attached immediately to the branches without any foot-stalk.

The FLOWERS are universally hermaphrodite, except in a species of thyme mentioned by Adanson, which appears to have male or barren flowers on one root, and female or fertile flowers on another.

They are disposed round the stem, as the title imports, in whorls, or small heads, with short foot-stalks.

The FLOWER-CUP is of one piece, that is generally cut into five unequal divisions, whose disposition sometimes represents two lips, the uppermost of which has commonly a less

lefs number of divifions. It accompanies the feeds, which it nourifhes in its bofom, to their maturity.

The PETAL is of the gaping or lip kind, and, in the different genera, is more or lefs irregular or unequal, either in its tube, or in the divifions of the upper part, the number of which varies from two to five. Thefe divifions frequently form two lips, of which the uppermoft, termed the creft and the helmet, is fometimes entire, fometimes more or lefs deeply cut into two; the lowermoft, termed the beard, generally into three. In germander and bugle the upper lip is very fhort, and over-topped by the ftamina.

The STAMINA are two, or four in number. In the greater part, there are four ftamina of unequal length, two of them being longer than the others; a character which determines fuch plants to the clafs *didynamia* of the Sexual Method. As to fage, rofemary, and the other genera with two ftamina, they are approximated to the other plants of this order, not only by their general habit, and the figure of the flower, but even in fome of the genera by the number of ftamina, which, although only two, yet are accompanied by filaments which refemble ftamina without the *anthers*. This appearance is particularly confpicuous in fage and a fpecies of monarda.

The four unequal ftamina are frequently diffimilar, and approach by pairs; they are inclined towards the back of the petal, and parallel; the two innermoft being fhorteft, and attached fomewhat lower than the two others to the tube of the flower.

The SEED-BUD, which confifts of four diftinct *ovaria*, is placed upon the feat of the flower, and elevates from their centre a common ftyle, that is flender, bent in the fame manner as the filaments which it fomewhat exceeds in length, and terminated by a double ftigma, the divifions of which are unequal, and turned backwards.

The SEED-VESSEL in this order is wanting.

The SEEDS are four in number, and lodged in the bottom of the flower-cup as in a matrix, or feed-veffel. Each feed has two covers; the one external, of a cartilaginous,

 or

or leathery ſubſtance; the other internal, membranaceous, of a very fine texture, and placed immediately above the radicle or embryo-plant.

The plants of this order are fragrant, warm, penetrating, and accounted cordial, and cephalic. Their principal virtue reſides in the leaves.

The chief aromatics are ſavory, thyme, marjoram, penny-royal, mint, balm, lavender, roſemary, ſage, clary.

VERTICILLUS, (properly, a little whorl, hinge, axis, or ſpindle); a mode of flowering, in which the flowers are produced in rings at each joint of the ſtem, with very ſhort foot-ſtalks. The term is exemplified in mint, hore-hound, and the other plants of the natural order deſcribed above.

VEXILLUM, a ſtandard; the upper petal of a pea-bloom, or butterfly-ſhaped-flower, which is generally larger than any of the others. *Vide* COROLLA and DIADELPHIA.

VIGILIÆ PLANTARUM, the vigils of plants.

Under this term, botaniſts comprehend the preciſe time of the day in which the flowers of different plants open, expand, and ſhut.

As all plants do not flower in the ſame ſeaſon, or month; in like manner, thoſe which flower the ſame day, in the ſame place, do not open and ſhut preciſely at the ſame hour. Some open in the morning, as the lipped-flowers, and compound flowers with flat ſpreading petals; others at noon, as the mallows; and a third ſet in the evening, or after ſun-ſet, as ſome geraniums, and opuntias. The hour of ſhutting is equally determined. Of thoſe which open in the morning, ſome ſhut ſoon after, while others remain expanded till night.

The hours of opening, like the time of flowering, ſeem to vary, according to the ſpecies of the plant, the temperature of the climate, and that of the ſeaſon. Flowers, whoſe extreme delicacy would be hurt by the ſtrong impreſſions of an ardent ſun, do not open till night; thoſe which require a moderate degree of heat to elevate their juices, in other words,

words, whoſe juices riſe in the morning or evening, expand then; whilſt thoſe which need a more lively heat for the ſame purpoſe, expand at noon, when the ſun is in his meridian ſtrength. Hence it is, that the heat of the air being greater betwixt the tropics than elſewhere, plants which are tranſported from thoſe climates into the cold or temperate climates of Europe, expand their flowers much later than in their native ſoil. Thus, a flower which opens in ſummer at ſix o'clock in the morning at Senegal, will not open at the ſame ſeaſon in France and England till eight or nine, nor in Sweden till ten; that which opens at eight at Senegal, expands at ten in France and England, and at noon in Sweden; a flower which opens at ten at Senegal, does not open in France and England till noon; and, in Sweden the plant does not flower, or, at leaſt, loſes its petals, and frequently bears no fruit; laſtly, a plant which opens its flowers in Senegal at noon, or at one or two hours after noon, bears neither flowers nor fruit in France, England, and Sweden. The ſame thing happens to moſt plants of temperate countries, when removed to Senegal, or other ſultry climes.

Linnæus diſtinguiſhes by the general name of *ſolar (flores ſolares)* all thoſe flowers which obſerve a determinate time in opening and ſhutting. Theſe flowers are again divided, from certain circumſtances, into three ſpecies, or kinds:

Equinoctial flowers *(flores æquinoctiales)* are ſuch as open and ſhut at all ſeaſons at a certain fixed or determinate hour.

Tropical flowers *(flores tropici)* are ſuch whoſe hour of opening is not fixed at all ſeaſons, but accelerated or retarded according as the length of the day is encreaſed or diminiſhed.

Meteorous flowers *(flores meteorici)* are ſuch whoſe hour of expanſion depends upon the dry or humid ſtate of the air, and the greater or leſs preſſure of the atmoſphere. Of this kind is the Siberian ſow-thiſtle, which ſhuts at night, if the enſuing day is to be clear and ſerene, and opens if it is to be cloudy and rainy. In like manner the African marigold,

which

which in dry ſerene weather, opens at ſix or ſeven in the morning, and ſhuts at four o'clock in the afternoon, is a ſure indication that rain will fall during the courſe of the day, when it continues ſhut after ſeven.

VOLVA, (properly, that wherein a thing is wrapped, *à volvo*, to roll up or infold). The membranaceous cover, (termed by Linnæus the calyx) which enfolds many muſhrooms before their expanſion, and burſts in order to make a free paſſage for the plant.

UMBELLA, (diminutive from *umbra*, a ſhade)—an umbel, a ſpecies of receptacle, or rather a mode of flowering, in which a number of ſlender flower-ſtalks proceed from the ſame centre, and riſe to an equal height, ſo as to form an even and generally round ſurface at top. The term differs from *corymbus*, another mode of flowering, in that there is a common part, the point, from which iſſue all the foot-ſtalks, and in that the foot-ſtalks are of an equal length; whereas in a *corymbus*, the foot-ſtalks proceed from different points, and though they altogether form an even ſurface at top, as in the umbel, yet is each lower foot-ſtalk of greater length than that immediately above it.

When none of the foot-ſtalks of an umbel are ſubdivided, as in ginſeng, it is termed ſimple; when, on the other hand, each flower-ſtalk is ſubdivided at its extremity into a number of ſmaller foot-ſtalks for ſupporting the flowers, in other words, when each foot-ſtalk bears at top an umbel, the whole head or aggregate is termed a compound umbel, to diſtinguiſh it from the ſimple, in which there are no ſubdiviſions, and, likewiſe, an univerſal umbel to diſtinguiſh it from the partial or particular umbel of each foot-ſtalk. An univerſal umbel is conſtituted from an aggregate of partial umbels. Compound umbels are more common than ſimple. Inſtances will be adduced below.

UMBELLATÆ (*ab* UMBELLA, *vide ſupra*) the name of a claſs in Ray's and Tournefort's methods, conſiſting of plants whoſe flowers grow in umbels, with five petals that are often unequal, and two naked ſeeds that are joined at top, and ſeparated below.

The

The same plants constitute the forty-eighth order of Linnæus's Fragments of a Natural method. Their names and general description follow.

List of the Genera contained in this Natural Order.

Linnæan Genera.			*English Names.*
Ægopodium,	—	—	Herb-gerard, gout-wort, or wild angelica.
Æthusa,	—	—	Lesser hemlock, or fools parsley.
Ammi,	—	—	Bishop's-weed.
Anethum,	—	—	Dill, fennel.
Angelica.			
Apium,	—	—	Parsley.
Arctopus.			
Artedia.			
Astrantia,	—	—	Black master-wort.
Athamanta,	—	—	Spignel.
Bubon,	—	—	Macedonian parsley.
Bunium,	—	—	Pig-nut, or earth-nut.
Bupleurum,	—	—	Hare's-ear.
Cachrys,			
Carum,	—	—	Carui, or caraway.
Caucalis,	—	—	Bastard parsley.
Chærophyllum,	—	—	Chervil.
Cicuta,	—	—	Water-hemlock.
Conium,	—	—	Hemlock.
Coriandrum,	—	—	Coriander.
Crithmum,	—	—	Samphire.
Cuminum,	—	—	Cumin.
Daucus,	—	—	Carrot.
Echinophora,	—	—	Prickly-parsnep.
Eryngium,	—	—	Eryngo.
Ferula,	—	—	Fennel-giant.
Hasselquistia.			
Heracleum,	—	—	Cow-parsnep.
Hydrocotyle,	—	—	Water navel-wort.

Imperatoria,

Linnæan Genera.			*English Names.*
Imperatoria,	—	—	Master-wort.
Laserpitium,	—	—	Laser-wort.
Ligusticum,	—	—	Lovage.
Oenanthe,	—	—	Water drop-wort.
Pastinaca,	—	—	Parsnep.
Peucedanum,	—	—	Hog's-fennel, or sulphur-wort.
Phellandrium.			
Pimpinella,	—	—	Burnet-saxifrage.
Sanicula,	—	—	Sanicle.
Scandix,	—	—	Shepherd's-needle, or Venus's comb.
Selinum,	—	—	Milk-parsley.
Seseli,	—	—	Heart-wort of Marseilles.
Sium,	—	—	Water-parsnep.
Sison,	—	—	Bastard-stone-parsley.
Smyrnium,	—	—	Alexanders.
Thapsia,	—	—	Deadly-carrot, or scorching-fennel.
Tordylium,	—	—	Hart-wort of Crete.

Habit and Structure of the Plants of this Order.

These plants are herbaceous, and chiefly perennial.

The ROOTS are either tuberous, or spindle-shaped, and sometimes forked.

The STEMS are cylindric, full of pith, and frequently hollow. The branches are alternate.

The LEAVES, which, like the branches, are put on alternately, are very different in point of form, being simple and entire in some; target-shaped in a species of water navel-wort; finger or hand-shaped in some others; and pinnated or winged with numerous minute divisions, as in the greater number.

They are supported by a foot-stalk, which is very broad and membranous at its origin, and commonly embraces the whole contour of the stem and branches.

The FLOWERS are, in general, hermaphrodite. There

E...
—— (dwarf).
Elm leaved sumach. See

F.

Farobier. See *Papilionaceæ*.
Florentine orrice. See *Ensatæ*.
Fragrant rush. See *Calamariæ*.
Fraxinella. See *Multisiliquæ*.
Freezing-wyth. See *Sarmentaceæ*.

G.

Garlick-pear tree. See *Putamineæ*.
Gentian. See *Rotaceæ*.
Geranium. See *Gruinales*.
Ginseng. See *Hederaceæ*.
Goat's-Thorn. See *Papilionaceæ*.
Greek valerian. See *Campanaceæ*.
Guava. See *Hesperideæ*.
Guaiacum. See *Gruinales*.
Guinea aloe. See *Coronariæ*.
——— Corn. See *Gramina*.
——— Pepper. See *Luridæ*.
Gum Arabic. See *Lomentaceæ*.
—— Copal. See *Dumosæ*.
—— Senegal. See *Lomentaceæ*.
Gypsophila fastigiata. See *Caryophyllei*.

H.

Hellebore. See *Multisiliquæ*.
Hemp. See *Scabridæ*.
Hibiscus (different species of.) See *Columniferæ*.
Herb-christopher. See *Multisiliquæ*.
Holly. See *Dumosæ*.
Hop. See *Scabridæ*.
Horizontal-cypress. See *Coniferæ*.
Horse-Cassia. See *Lomentaceæ*.
Hypericum (species of). See *Rotaceæ*.

Dumosæ.
...r. See *Coniferæ.*

L.

Labdanum. See *Rotaceæ.*
Laburnum. See *Papilionaceæ.*
Larch-tree. See *Coniferæ.*
Lily (white). } See *Coronariæ.*
—— (Martagon). }
Lime or Linden-tree. See *Columniferæ.*
Liquorice. See *Papilionaceæ.*
Logwood. See *Lomentaceæ.*
Lycopodium. See *Musci.*

M.

Magnolia. See *Coadunatæ.*
Mahogany. See *Miscellaneæ.*
Maiden-hair (different species of). See *Filices.*
Malabar night-shade. See *Holeraceæ.*
——— oleander. See *Contortæ.*
Male balsam-apple. See *Cucurbitaceæ.*
Manchineel-tree. See *Tricoccæ.*
Mangroves, or mangles. See *Holeraceæ.*
Manioc, manihot or cassava. See *Tricoccæ.*
Marsh-mallow (common). See *Columniferæ.*
Melastoma (East-Indian species of). See *Calycanthemæ.*
Melianthus, or honey-flowers. See *Corydales.*
Mitre-shaped aloe. See *Coronariæ.*
Monkshood. See *Multisiliquæ.*
Montpelier-scammony. See *Contortæ.*
Moon-seed. See *Sarmentaceæ.*
Mountain-bistort. See *Holeraceæ.*
Musk-melon. See *Cucurbitaceæ.*
Myrtle. See *Hesperideæ.*
Myrtle-leaved sumach. See *Miscellaneæ.*

Nettle.

N.

Nettle-tree. See *Scabridae.*
New-Jersey tea. See *Dumosae.*

O.

Okra. See *Columniferae.*
Oleander, or rose-bay. See *Contortae.*
Oleaster, or wild olive of Bohemia. See *Calyciflorae.*
Orchis. See *Orchideae.*
Opuntiae, or Indian figs. See *Succulentae.*

P.

Palmetto, or thatch. } See *Palmae.*
Palm-oil tree, }
Pearl-aloe, } See *Coronariae.*
Penguin, or karatas. }
Pepper of Senegal. See *Piperitae.*
Persian manna. } See *Papilionaceae.*
Pigeon-pea }
Pimento, or all-spice. See *Hesperideae.*
Pine (cultivated). See *Coniferae.*
Pine-apple. See *Coronariae.*
Pineaster. } See *Coniferae.*
Pitch-tree. }
Poet's ivy. See *Hederaceae.*
Poison-ash. } See *Dumosae.*
Poison-tree. }
Polypody. See *Filices.*
Popo-tree. See *Tricoccae.*
Prickly anonis. See *Papilionaceae.*
Pumpkin. See *Cucurbitaceae.*

R.

Red jasmine. See *Contortae.*
Reeds. See *Gramina.*
Rhamnus alaternus. } See *Dumosae.*
——— *frangula.* }
Rhubarb. See *Holeraceae.*
Rice. See *Gramina.*
Ricinus, or palma-christi. See *Tricoccae.*
Royal Osmund. See *Filices.*

S.

Saffron. See *Ensatae.*
Sago-tree. See *Palmae.*
Sapota. See *Dumosae.*

Saffafras-tree. See *Hederaceæ.*
Scammony. See *Campanaceæ.*
Scorpion-fenna. See *Papilionaceæ.*
Screw-tree. See *Columniferæ.*
Sea bind-weed. See *Campanaceæ.*
Senna.
Senega rattle-fnake root. } See *Lomentaceæ.*
Senfitive plant.
Shrubby medick. See *Papilionaceæ.*
Silk cotton-tree. See *Columniferæ.*
Soap-wort (official). See *Caryophyllei.*
Solanum (fpecies of). See *Luridæ.*
Sour-fop. See *Coadunatæ.*
South-fea tea. See *Dumofæ.*
Spanifh patatoe. See *Campanaceæ.*
Spindle-tree. See *Dumofæ.*
Spruce firs of North America. See *Coniferæ.*
Spurious varnifh-tree. See *Dumofæ.*
Squafh. See *Cucurbitaceæ.*
Squills. See *Coronariæ.*
Staff-tree.
Star-apple. } See *Dumofæ.*
Storax-tree. See *Bicornes.*
Succotrine aloes. See *Coronariæ.*
Sugar-cane. See *Gramina.*
Swallow-wort (common). See *Contortæ.*
Sweet-rufh. See *Piperitæ.*
Syrian dog's-bane. See *Contortæ.*

T.

Tea-fhrub. See *Columniferæ.*
Thapfia. See *Campanaceæ.*
Tooth-ach tree. See *Hederaceæ.*
Traveller's joy. See *Multifiliquæ.*
Tree-vervain, mallow of Java. See *Columniferæ.*
Tulip-tree. See *Coadunatæ.*
Turbeth, or turbith. See *Campanaceæ.*

V.

Vanelloes. See *Orchideæ.*
Varnifh-tree. See *Dumofæ.*
Venice-fumach. See *Dumofæ.*
Venus's fly-trap. See *Lomentaceæ.*
Vetch (bitter). See *Papilionaceæ.*
Vinegar-tree.
Virginian fumach. } See *Dumofæ.*

W.

Warted-gourd. See *Cucurbitaceæ*.
Water-melons, or citruls. See *Cucurbitaceæ*.
Water-soldier. See *Palmæ*.
White bryony. See *Cucurbitaceæ*.
White hellebore. See *Coronariæ*.
White mullein. See *Luridæ*.

Y.

Yams. See *Sarmentaceæ*.

THE END.

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[illegible]	Swammerdam,	Ray,	[illegible]	Pennant,
[illegible]	[illegible]	[illegible]	[illegible]	and

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